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A CASE OF CHLOROMA. W. H. ROBERTS

FIG. 8. CONVEXITY OF SKULL AFTER REMOVAL OF SOFT PARTS. TUMORS PRESENTING ALONG THE SUTURE LINES.

FIG. 9. APPEARANCE OF BASE OF SKULL AFTER REMOVAL OF BRAIN.

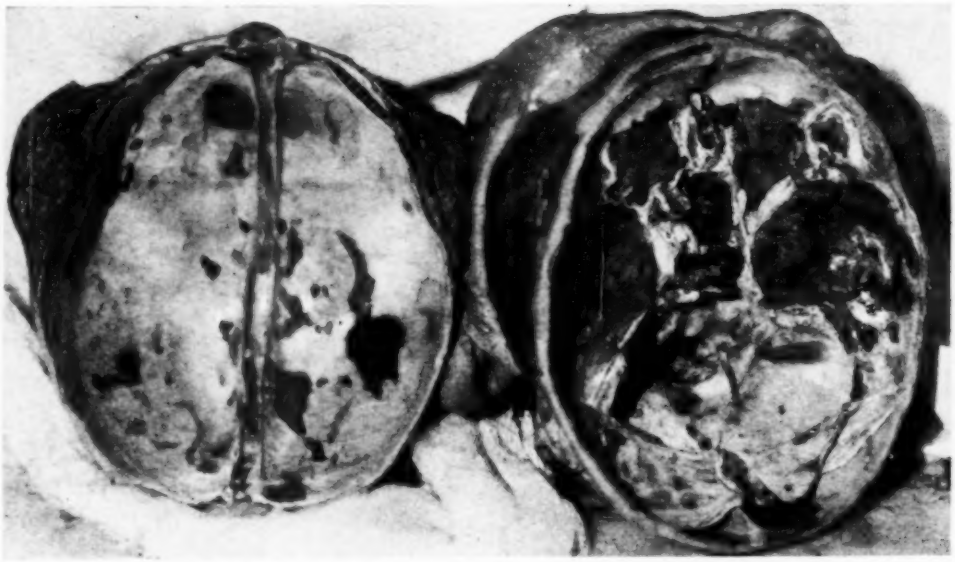

FIG. 10. CONCAVE SURFACE OF DOME OF SKULL. LEFT. EXTENSION OF GROWTH INTO ORBITS AND SPHENOIDS AND SUBPERIOSTEAL PROLIFERATION IN EACH TEMPORAL REGION. RIGHT.

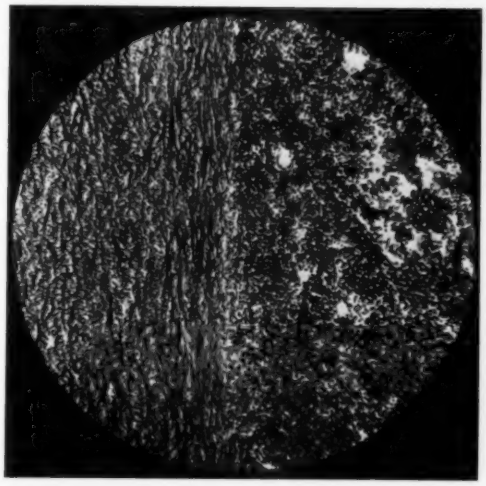

FIG. 11.—CHLOROMA. SECONDARY GROWTH ON ABDOMINAL AORTA. (100 DIAMETERS.)

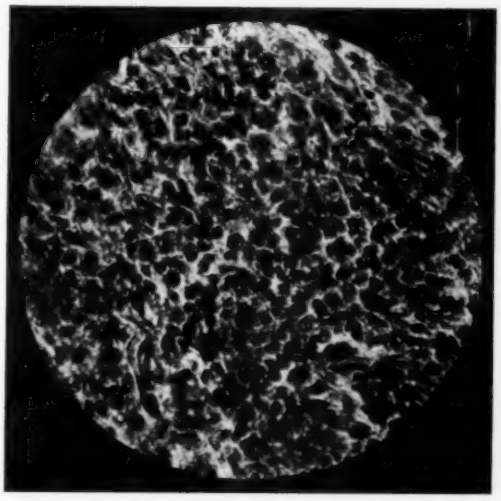

FIG. 12.—CHLOROMA CELLS, FROM PART SHOWN IN FIG. 11. (350 DIAMETERS.)

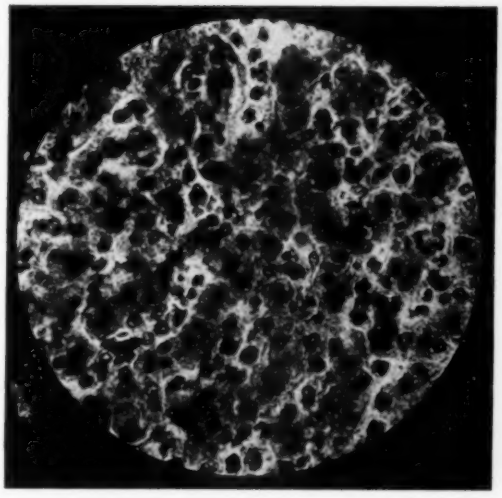

FIG. 13.—CHLOROMA CELLS IN LIVER. (350 DIAMETERS)

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A CASE OF CHLOROMA.

WILLIAM HUMES ROBERTS, M.D., F.A.C.S.

PASADENA, CALIFORNIA.

The disease occurred in a boy of two and one-half years, previously healthy; and ran its course to death within three months. The progress of the case and lesions found postmortem are shown in a series of photographs and the colored plate. Read before the Los Angeles Ophthalmological Society, November 15, 1922.

Chloroma is a sufficiently rare disease to warrant the report of this very interesting case. Only ninety cases have been reported in the literature. Very few of us have ever seen this condition, many in fact have never heard of it.

Chloroma is a malignant disease akin to sarcoma, of the blood making structures, of the leucemic type, and like all leucemias, does not destroy the body tissues, but by mechanical pressure produces the lesions found. It derives its name from the typical pale green tumors found all thru the body.

It has a characteristic blood picture, referred to later, from which an early diagnosis can be made. As the disease chiefly attacks children and young adults, a complete blood examination should be made early in all cases of exophthalmus presenting in young people.

Fig. 1. August 25, 1922. Showing right proptosis, congestion of blood vessels of ocular conjunctiva and prominence above each zygoma.

Some authorities differentiate by the blood picture two varieties of this disease, the myeloid and the lymphatic. The myeloid shows a steadily increasing number of myeloblasts and myelocytes, nucleated erythrocytes, and intermediary forms of the two. Eosinophiles

and mast cells may be increased or absent. The lymphatic type shows first a destruction of the leucocytes followed by a rapid increase, running up even into the hundreds of thousands, falling below normal before death.

The etiology is unknown.

The first clinical symptoms, as seen by the oculist, are exophthalmus, orbital and lid tumors, retinal and subconjunctival hemorrhages, papillitis, and subperiosteal proliferations, affecting especially the cranial bones. Before death nearly all parts of the body become invaded by the typical tumors, as will be found in the pathologist's report.

Treatment is of no avail and has included the use of radium, X-rays and benzol. Death has occurred in all cases and usually within three months from the date of onset.

Dr. Arthur J. Bedell reported four cases of this disease before the International Congress of Ophthalmology held in Washington, D. C. last April. His paper is published in the Transactions of the Congress and has appended a complete bibliography.

My case is as follows:

R. D. N. Male, aged thirty-two months, was first seen by me August 14, 1922, and the following history obtained.

Family History: Father alive and in good health. Mother thin, nervous and has recurrent epileptic attacks, otherwise well. One brother and one sister both older and quite well.

The patient was born December 11, 1919. Birth normal, was breast fed until 7 months old, and then did well on goat's milk. He had much trouble teething, tho he seemed normal in every respect until early in July, 1922, when the mother noticed he was restless, which she attributed to a premolar tooth that was erupting. Soon she discovered that the right eye was becoming prominent. She waited 10 days before taking the child to Dr. H. M. Coulter of South Pasadena, who discovered a mitral insufficiency. For the eye condition she consulted Dr. A. E. Strong of Alhambra. Dr. Strong had a Wassermann taken, which was reported ++. A fluoroscopic tracing seemed to show the heart enlarged in its lateral diameter, with enlargement of the arch of the aorta.

As Dr. Strong left on his vacation about this time, the child was brought

Fig. 2. August 25, 1922. Shows right proptosis and the enlarged blood vessels of the ocular conjunctiva.

to me on August 14, 1922, and the following conditions noted.

The right eye was slightly proptosed and appeared larger than the left, giving a first impression of buphthalmos, but there was no enlargement of the cornea, tension or cupping. The eyelids closed over the globe, there was no ocular congestion, pupils were active and even, no limitation of motion, and fundus examination normal, with no evidence of intracranial pressure. There was some edema of both lids of the left eye of 24 hours duration. No tumor could be felt in the right orbit. There was a slight prominence above each zygoma, posterior to the orbital process of each malar bone. The child seemed to have some difficulty in breathing thru his nose and had complained of pain in his right ear a few days previously. The examination of his ears, nose and throat was negative. His nasopharnyx could not be examined. At times the child seemed to be in pain but its source could not be determined.

In view of the positive Wassermann and the enlarged aorta, we were inclined to regard the condition as specific with a possible gumma in the right orbit. He was placed on antispecific treatment by Dr. Coulter. He grew steadily worse, however, and was next seen by me on August 23, 1922. At this time the mother said the child appeared to have pain at night, but was eating well.

I found the right eye more proptosed, upper lid not fully closing over it, much more marked tumefaction above each zygoma, slight limitation of movement of right eye outward. There was a beginning congestion of the vessels of the lower bulbar conjunctiva. On deep pressure inside the orbital margin a distinct tumor could be felt in the upper and lower temporal part of the orbit. The edema of the left lids had disappeared, but a tumor could be felt below the left orbital rim. He was seen by Dr. J. Ross Reed in consultation, who, in addition to the above findings, thought he could make out a beginning right optic neuritis. At subsequent visits the child would not permit of ophthalmoscopic examinations, but he seemed to retain good vision until the end. No deafness developed.

In view of the rapid development of the above symptoms in spite of the treatment, we had Wassermanns done

Fig. 3.—August 25, 1922. Lateral view.

on both parents and the child by Drs. Brem, Zeiler, and Hammock, and all were negative. X-ray plates of the chest showed no aortic or heart enlargement, so a diagnosis of sarcoma of the orbit probably originating in the sphenoids was made, and the case declared inoperable.

August 25, 1922, showed still more proptosis of right eye and greater enlargement above each zygoma. The photographs 1, 2, and 3, show the condition as observed that day. The engorgement of the vessels of the lower bulbar conjunctiva had markedly increased.

On August 30th, the above findings were all much more marked and a dense tumor mass could be felt thru the left lower lid extending down into the malar region.

The child was taken to Dr. Carl Rand in hopes that a ventriculogram might be of some help in arriving at a diagnosis, but he did not think it wise to make it, considering the tumor a sarcoma arising from the sphenoids and inoperable. In a few days he changed his diagnosis to chloroma, having run across the description of a very similar case. Enlarged glands the size of buck shot could now be made out all over the child's body.

The disease progressed rapidly, the left eye beginning to proptose the tumor under the left eye growing fast, encroaching on the nose and extending along the ramus of the jaw on the left side. With this breaking thru of the tumor mass on the left side of the face, the pressure back of the right eye seemed to be relieved and the proptosis became less. Nasal breathing became more and more difficult as the tumor filled the nose, pharynx and involved the palate process of the superior maxilla. Photographs 4 and 5 show the condition on September 18, 1922.

Fig. 4. September 18, 1922. Shows right proptosis. Great prominence of blood vessels of ocular conjunctiva. Tumor below left encroaching on nose. Increased prominence above each zygoma. Characteristic position of mouth.

Examination of the blood by Dr. A. M. Moody, pathologist of the Pasadena Hospital, on Sept. 5, 1922, showed a typical picture of the disease. White blood cells were 28,000.

I next saw the child at his home on October 9, 1922. He was in a pitiable condition, moaning continually and holding his hand to his forehead. His head appeared to be hydrocephalic, until examination showed that the enlargement was due to the tumor formation above each zygoma region, ex-

tending up the squamous portion of each temporal bone into each parietal. The left side of the nose was almost hidden by the growth in the malar region. The right proptosis was not as marked as formerly, but the right lids were so edematous that he could not open them. The proptosis of the left had increased appreciably, but the child could still see. Prominent veins showed over each ramus.

Fig. 5. September 18, 1922. Lateral view.

The nasal cavity and upper part of the mouth seemed entirely occluded by the growth, the child breathing only thru the mouth and refusing all nourishment.

After this, hemispherical firm tumors began to appear along the suture lines between the frontal and parietal bones, and along the intraparietal suture back as far as the occipital bone. During the last 36 hours of his life he had severe nasal hemorrhages.

He died October 25, 1922. Photographs 6 and 7 show the appearance at time of death.

The autopsy was performed by Dr. A. M. Moody, pathologist of the Pasadena Hospital, and his report closes this paper.

Photograph 8 shows the tumors presenting along the suture lines; 9, the tumor occupying the base of the skull after removal of the brain; 10, the extension of the masses into the sphenoid and each orbit, and the under surface of the dome of the skull.

Pathologic report of Dr. A. M. Moody: Postmortem.

This is a moderately emaciated body of a male child with a greatly enlarged and distorted head, due to nodular tumor growths beneath the skin, involving the bones of the face and the top of the head. The cervical, axillary, and inguinal glands are enlarged and palpable. The mouth is held open, due to tumor growths in the posterior angle of the jaw. The eyeballs are pushed forward and the palpebral fissure is wide. There are large tumors in both temporal regions, and tumor nodules extending along the coronal and sagittal suture lines backward as far as the occiput. The scalp is removed. The above nodules are seen as very pale greenish tumor masses. The nodules in the temporal regions, which practically replace the temporal muscle, protrude a distance of 1.5 cm. to 2 cm. and are 6.5 cm. to 8 cm. in the anteroposterior diameter. The other nodules in the calvarium vary in size from a few millimeters to 1.5 cm. in diameter. These tumor masses are growing between the bones, and have spread them apart to some extent. They have extended also along the

dura into the superior longitudinal sinus, and between the dura and the skull in the anterior fossa, forming in this region, large, broad, dense, flat, greenish tumor masses. There is also an extension into the orbital cavities and all of the accessory sinuses of the skull. The optic nerves are surrounded by tumor growth, but not infiltrated. The brain is adherent to the tumor mass, thru its piaarachnoid, in the anterior fossa, but it is not itself invaded by tumor. There is also an extension of the tumor along the falx cerebrae. The sphenoid sinuses are completely filled, and it appears that the tumor has extended from this point into both orbital cavities, nasal cavity, and out beneath the zygoma into the cheeks. From here the tumor mass extends the full length of the anterior surface of the spinal column, surrounding the aorta and continuing into the pelvis to the tip of the spine.

On opening the abdomen, a small tumor nodule, similar in appearance, is found in the subcutaneous tissue in the anterior abdominal wall in the median line. The mesentery glands are enlarged, hard and greenish in color. The solitary follicles, and Peyers patches, are enlarged and can be seen thru the unopened bowel. There are nodules in the under surface of the sternum, and along the diaphragm. Acute edema and petechial hemorrhages are disseminated thruout both lungs, which also contain what is apparently aspirated blood.

The thymus is altered grossly.

Fig. 6. Appearance after death.

The pericardial cavity contains a considerable amount of clear fluid. There are petechial hemorrhages in the visceral pericardium, near the septum, and over the right ventricle. On opening the heart it contains a large amount of thin fluid blood, which is pale red in color. There are no alterations in the valves. The heart muscle is rather yellowish grey in color and friable.

The liver is slightly enlarged, rather greyish in color, and contains an occasional hemorrhage beneath the capsule. There are two small nodules, greenish in color, in the head of the pancreas, with numerous enlarged lymph glands, also greenish in color, around it. The adrenals are unaltered.

The right kidney contains two nodules in the cortex, but is otherwise un-

altered. In the pelvis of the left kidney is a large nodule that is greenish in color. This entire kidney appears as tho it were diffusely infiltrated with lymphoid tissue.

The spleen is slightly enlarged so that it is about one and one-half times the normal size, but contains no nodular masses.

The bone marrow is greyish green in color and definitely hyperplastic.

Fig. 7. Appearance after death.

Anatomic Diagnosis: Chloroma, involving the bones of the face, skull, the dura mater, the anterior surfaces of the spine, the viscera, lymph glands, and bone marrow. Bilateral exophthalmus. Edema of both lungs. Severe anemia. Petechial hemorrhages in the pericardium, lungs, liver, and skin of face. General hyperplastic lymphatitis. Hyperplasia of the bone marrow.

Histologic Examination: The tumor masses above described consist essentially of small round cells with deeply staining nuclei, resembling lymphocytes. There are numerous mitotic figures, and the cells are rather closely packed with a connective tissue supporting stroma, in which are rather numerous thin walled blood vessels. There are also found here and there thruout, mononuclear eosinophiles resembling eosinophilic myelocytes.

The tumor mass surrounding the aorta (microphotograph, plate 11x100 diameters) is attached to the muscularis very intimately but does not invade it. In the kidneys the tumor masses are of similar structure to that above described, but fade out into the surrounding kidney substance. The mononuclear eosinophiles are more numerous here than elsewhere.

The spleen contains very noticeable infiltrations with similar tumor cells and atrophy of the normal lymphoid follicles. In all regions of the heart and liver examined, where hemorrhages had been noted grossly, there are infiltrations and accumulations of lymphoid cells.

The bone marrow is distinctively lymphoid in character, and here one finds a very high percentage of eosinophiles.

An examination of the blood from the heart taken at autopsy reveals the following: white cells in the proportion to red cells as one is to six; polynuclear neutrophiles — 10%; lymphocytes (including lymphoblasts and other unclassified mononuclear cells) 89%; eosinophilic myelocytes — 1%. Of the 89% lymphocytes, 38% were small, and 51% large (these varying in size from 12 to 40 microns in diameter.) The red cells are characteristic of those seen in secondary anemia.

ECLIPSE AMBLYOPIA.

R. E. WRIGHT, MAJOR, I.M.S., AND T. VENKATARANGAM NAIDU.

MADRAS, INDIA.

This is the record of twenty-one cases appearing in the Government Hospital at Madras following the eclipse of the sun in September, 1922. The details are given in tabular form.

During the eclipse of Sept. 21, 1922, a number of individuals in and about Madras sustained retinal injuries thru looking at the sun either directly or thru some sort of smoked or colored glass. In the Government Ophthalmic Hospital, 21 cases came to our notice. For the most part the ophthalmoscopic appearances correspond very closely with those of 'sun gazing' as described by Lieut. Col. Kirkpatrick in Elliot's 'Tropical Ophthalmology', so that details need not be gone into here. It will be sufficient to show in tabular form the main points of interest in this series.

Probably the most striking point is the mildness of the damage, as compared with cases reported from other countries. Practically all the cases showed marked and rapid improvement. The investigation of the visual fields gave negative findings, except in one instance, which may be considered somewhat unsatisfactory. One gathers that the prognosis in this type of injury is good. It may very well be that the average deeply pigmented Indian eye is less damaged by the trauma of direct sunlight than is the less pigmented eye of the inhabitants of more temperate climates.

These cases, in so far as permanent injury goes, are evidently not on a par with *sun gazers.* The latter type of individual may expose himself frequently during the year for a number of years. In such the prognosis is much worse, but not invariably so bad as might be expected. At the present time we have under observation a young Indian, male, aged 28, who has been in the habit of gazing at the sun with the right eye, several times a year for the past three years; who has a discrete, horizontal, rod like marking at the macular center, of a deep maroon color, about ¼ d.d. in length, and ⅓ of this in depth, surrounded by a smoky halo. The vision in this right eye is 6/12 with —0.5 D. The left eye vision=6/5.

TABLE OF CASES OF ECLIPSE AMBLYOPIA.

Name and case No.	Nature of exposure on 21-9-1922	Duration of exposure	One or both eyes	Immediate effect	After images	Late effect	Vision Date of	Fundus Changes	Scotomata	Form field	Progress	Refractive error	Remarks
1. K., age 20	Naked eye.	Few seconds.	Both	Dimness in front of left eye.	Nil	Dimness diminishing.	R. E. V.=6/6 L. E. V. =6/9 22-9-22.	Bronzing round fovea, slight within normal limits.	Nil for white or color	Not taken.	After a week R. E. V.=6/5 L. E. V.=6/5	Nil	Within normal limits.
2. W., age 20	Thru smoked glass.	Few minutes.	Both	Dimness.	Nil	Dimness of vision.	R. E. V. =6/5 L. E. V.=6/12 28-9-22.	Discs slightly hyperemic, left fovea shows distinct white center and bronzed halo.	Nil	Not taken		Nil	The left fovea and surroundings were quite within normal limits, but the asymmetry was significant.
3. S., age 22	Smoked glass and without.	Short time.	Both	Nil.	Nil	Dimness of vision next day.	R. E. V.=6/9 N. I. G. L. E. V.=6/24 N. I. G. 16-10-22.	Discs are possibly slightly hyperemic, but both maculae and discs are well within normal limits.	Nil	Not taken	Did not attend	Nil	
4. P., age 22	Naked eye and smoked glass.	Very short time.	Both	Slight pain and smarting lasting for a few minutes.	Nil	Dimness of vision.	R. E. V.=6/20 L. E. V.=6/20 c—1.0=6/10 25-9-22.	Discs very red, no tortuosity, circumpapillary edema slight, fovea showed white center (reflex) and a narrow very dark maroon rim. Foveae not symmetric.	Nil	Not taken	After 3 weeks R. E. V. =5/15 N. I. G. L. E. V. =6/6 without glasses	Nil	In this case there was conjunctival hyperemia and lacrimation.
5. R., age 15	Naked eye.	Few seconds.	Both	Dimness for few minutes.	Nil	Improved.	R. E. V.=6/5 L. E. V.=6/5 27-9-22.	Small bright reflex surrounded by a bronze areola both eyes.	Nil	Not taken	Vision good, did not attend.	Nil	
6. K., age 19	Smoked glass.	Few seconds.	Right eye	Dimness of vision.	Nil	Continued dimness.	R. E. V.=6/12 L. E. V.=6/5 21-10-22	Macula showed maroon color (right eye only) round bright central dot.	Nil	Normal for form. Blind spot slightly irregular	After a week. 6/5 each eye. Maculae symmetric.	Nil	
7. S., age 28	Naked eye.	Few seconds.	Both	Feeling of glare for 10 minutes.	Nil	Dimness for distance and slight pain right eye.	R. E. V.=6/60 L. E. V.=6/6 28-9-22	Symmetric hyperemia of discs. Lobulated central pale fovea surrounded by bronze haze.	—		R. E. V.=6/60 L. E. V.=6/5 bar-3 1s. 17-11-22	Nil	
8. J., age 17	With and without smoked glass.	Few seconds.	Both	Increased dimness of right eye which had been previously defective.	Nil	Central blurring.	R. E. V.=6/60 L. E. V.=6/6 25-9-22	Left normal, right central dot like reflex, and a narrow pale ring surrounded by maroon area 1/3—1/2 disc diameter.	Central relative scotoma	Not taken	After 2 weeks. R. E. V.=6/12 N. I. G. L. E. V.=6/5	Nil	

Name and case No.	Nature of exposure on 21-9-1922	Duration of exposure	One or both eyes	Immedies effect	After images	Late effect	Vision Date of	Fundus Changes	Scotomata	Form field	Progress	Refractive error	Remarks
9. S., age 30	With smoked glass.	Short time.	Both	Dimness of vision.	Nil		R. E. V.=6/9 partly L. E. V.=6/12 partly 10-10-22	Discs normal except for fullness of veins. Left fovea dark red and hyperemic all round.	Nil	Normal	17-11-22 R. E. V.=6/6 L. E. V.=6/6 Improvement in left macular appearance.	Plus 0.75 Hypermetropia each eye.	The dark red fovea was remarkable in this case.
10. K., age 36	Naked eye.	Short time.	Both	Nil.	Nil	Four hours after noticed defective vision.	R. E. V.=6/12 L. E. V.=6/12 24-9-22	Slight circumpapillary edema. Slaty blue fovea with wide band of maroon color round it.	Nil	Not taken	After 12 days. R. E. V.=6/9 L. E. V.=6/9	Nil	Maroon area almost as big as disc.
11. J.,	Naked eye.	Short time.	Both	Defective sight.	Nil	Defect for both near and distance.	R. E. V.=6/9 partly L. E. V.=6/9 partly 25-9-22	A central white spot (reflex at fovea) surrounded by a deep smoky ring.	Nil	Not taken	After 16 days Vision = 6/5 partly each eye	Nil	
12 J., age 20	Naked eye.	Short time.	Left eye	Dimness of vision.	Nil	Continued dimness.	c—2.0 Ds. each eye, R. E. V.=6/9 L. E. V.=6/18 14-10-22	Swelling of discs, very small maroon colored areas round fovea.	Nil	Not taken	25-10-22 R. E. V.=6/9 L. E. V.=6/24	—2.0 each eye.	
13. V., age 26	With and without smoked glass.	Short time.	Left eye	Dimness of vision.	Nil	Continued dimness.	R. E. V.=6/5 bar 2 1s. L. E. V.=6/5 bar 3 1s. 8-10-22	Right normal, left definite hyperemia of disc with tortuous vessels, no damages at macula.	Nil	Not taken	13-10-22 Better, did not come again	Nil	
14. J., age 13	Naked eye	Short time.	Right eye	Defective vision.	Nil	Continued dimness.	R. E. V.=6/9 L. E. V.=6/5 7-10-22	Normal.	Nil	Not taken	Did not report.	Nil	
15. R. age 20	Naked eye. and smoked glass.	Very short time.	Both	Dimness of vision.	Nil	Continued dimness.	R. E. V.=6/9 L. E. V.=6/9 17-10-22	Normal.	Nil	Fields normal	Did not come.	Nil	
16. A., age 22	Naked eye.	Short time.	Right eye	Dimness of vision.	Nil	Continued dimness of vision.	R. E. V.=6/24 c—1.0=6/12 L. E. V.=6/5 2-10-22	Normal.	Nil	Fields normal. Blind spot normal.	Did not attend.	Nil	

							of vision. 2-10-22			normal.			
17. K., age 16	With smoked glasses.	Short time.	Both	Slight dimness, became worse.	Nil	Continued worse.	c̄ glasses R. E. V.=6/12 L. E. V.=6/18 22-9-22	Macula shows central white reflex with deep band of maroon.	Nil	Not taken	11-10-22 With glasses R. E. V.=6/8 L. E. V.=6/9	Nil	Was a myope of —6.0 D and was wearing glasses.
18. V., age 20	With and without glasses.	Short time.	Both	Slight, became dim.	Nil	Continued dimness.	R. E. V.=6/12 L. E. V.=6/9 27-9-22	Definite white center to fovea surrounded by pale areola and then a band of bronze.	Nil	Not taken	10-10-22 R. E. V.=6/9 L. E. V.=6/9		Did not attend subsequently. Slight right improvement.
19. S., age 20	Naked eye.	Short time.	Right eye	Dimness of central letters in reading with clearness of side letters.	Nil	Continued with pain on and off in right eye.	R. E. V.=6/5 partly L. E. V.=6/5 partly 23-9-22	Normal.	Nil	Not taken	Did not attend.		A minimal effect.
20. R., age 28	Smoked glass.	Short time.	Both	Cloudy vision at the center.	Nil	Continued dimness.	R. E. V.=6/5 L. E. V.=6/5 partly 28-9-22	Normal.	Nil	Not taken	Did not attend.		A minimal effect.
21. S., age 19		Short time.	Both	Defective sight for distance.							Did not attend.		Sharply marked sectoral defect in right eye. Unfortunately this case went away with his notes, leaving only the charts.

*No enlargement of blind spot. R.E.—There is a relative sectoral scrotoma down from the center of 10° arc between 270° radius and 330° radius. There is an absolute scotoma which is an extension of the above to the periphery along the same radii. L.E.—There is an irregular absolute scotoma on nasal side, extending from 10° arc to the periphery. The inner limit extends from 130° radius above to 215° radius below, 15° circle from 120—235, 20° circle from 125—230, 25° circle from 110—240. The tests were made with 2 m.m white at 1 meter.

NOTE:—Peripheral hemorrhages were not met with in any of the cases.

CONGENITAL TOTAL BILATERAL OPHTHALMOPLEGIA.

T. M. Li, M.D.

PEKING, CHINA.

Three children out of five were thus affected. The paralysis was probably nuclear. There was slight convergence and divergence. Operation for the condition was not considered a success. Reported from the service of the Peking Union Medical College.

Altho partial congenital paresis of the ocular muscles, for example the superior rectus muscle, with or without secondary changes in the inferior oblique of the opposite eye, is occasionally met with in China, congenital ophthalmoplegia, either external or internal, is very rare.

During seven and a half years of extensive practice in Canton and in Peking, Dr. Howard has not seen a single case of complete congenital ophthalmoplegia. During five years of service at the Peking Union Medical College Hospital, with the exception of the cases herewith to be reported, I have not met with a single case of ophthalmoplegia. Even congenital ptosis is very rarely seen. The following report of two cases is therefore of interest. The paresis is bilateral, it involves all the muscles, and is almost complete.

Case 1. A female child, 4 years of age, was brought into our eye clinic for treatment on November 21, 1921. From the child's mother the following history was obtained:

At birth, the mother noticed that both eyes of the child turned outward. The child was unable to open her lids voluntarily. After a week or ten days she was able to open them very slightly. This condition remains the same until this day. The mother is unable to tell which of the lids has the greater elevating power, but the eye which the child uses to see with always opens a little wider than the other—the child uses her eyes independently. Her eyeballs have been always practically immobile since birth. This child had an elder brother who was also born with a similar condition, but to a lesser degree. He died at the age of two. Patient has another elder brother, who is now 11 years old, and the first born child of the family. Physical, neurologic, and ophthalmologic examinations made on this brother revealed nothing abnormal. Patient, however, has a younger sister, 3 years of age, born with a similar condition; but the last baby of the family, a girl, is physically sound and shows no ptosis or squint.

The mother has never had an abortion or miscarriage. Both parents are under forty and are about the same age. They are healthy and strong and show no congenital anomaly of any kind. There is no consanguinity; the family names are different. As far as they know their ancestors did not have "drooping of the lids or turning in or out of their eyes."

The Wassermann reaction of both parents' blood is negative.

Patient's V. O. D.=6/15 minus, illiterate chart. V. O. S.=6/15, illiterate chart.

Under complete cycloplegia with atropin, the following result in refraction is obtained:

Retinoscopy: O. D.=+6.50 in the vertical meridian and +7.50 horizontal. O. S.=+6.50 vertical and +7.00 horizontal.

Trial case: O. D.=4.50 with +0.50 cyl. ax. 105°=6/20+. O. S.=+5.00 with +0.50 cyl. ax. 90°=6/15.

Lids: There is no swelling in either lid, both lids droop, the skin is smooth and somewhat stretched. In the primary position both palpebral fissures are almost the same; the inner borders of the eyebrows are much elevated (Fig. 1). The skin of the forehead is thrown into numerous irregular parallel folds. When left to her own will, patient prefers to fix with her left eye and tilts her head to the right. The left palpebral fissure then becomes widened while the right becomes correspondingly narrower. The folds over the left brow are more elevated while those of the right are lowered (Fig. 1). In order to see more clearly, patient often uses her left index finger to push the left lid up. If the patient's head is tilted toward the left, she will then use her right eye to fix.

and the same expression is noted in the opposite side (Fig. 2). The elevation of the lids is brought about entirely by the contraction of the frontal fibers of the occipitofrontalis.

Lacrimal apparatus of either eye is normal.

Conjunctiva: The palpebral conjunctiva of both the lower and upper lids of either eye is slightly injected. The upper palpebral conjunctiva contains a few trachoma follicles. Bulbar conjunctiva is normal.

Cornea: There is slight pannus involving the upper corneoscleral margin. Both corneas are practically the same in shape and size.

Pupil: The right pupil is small and contracted. It is slightly pear shaped and measures about 1.5 mm. in its widest diameter. The left pupil is a trifle smaller than the right and measures about 1.25 mm. It is diagonally oval at about 75 degrees meridian. Light reflexes and reaction to accommodation cannot be made out, except with a pencil of strong light directed onto the macular region of each eye. The pupils then show very slight alternate contraction and dilatation. Under atropin the pupils are semidilated. The right one is vertically oval and measures approximately 4 mm. by 4.5 mm., and is a little displaced upward and inward. The left pupil is slightly diagonally oval at about 105 degrees and measures about 4 mm. by 4.25 mm., and is displaced upward and inward.

Eyeball and *ocular muscles*: As far as it can be determined, both globes are normal in shape and size. Both globes are practically fixed in a divergent position. The right eye is more deeply set in the orbit and is rotated down and out (Fig. 4). When the patient is directed to look to the right, or to the left, there is elicited a little function in the interni muscles, but neither eye can approach to the median line. The elevating, depressing, and the abducting powers are practically nil.

Fig. 1. Case 1. Eyes in primary position. Ptosis, elevation of brows, and creases in brow.

Fig. 2. Case 1. Fixing with the right. Lids elevated by frontalis.

Ophthalmoscopy: O.D.=Media clear, disc almost round, hyperemic, margin well defined and regular, deep physiologic cupping, arteries normal, veins slightly engorged, macula and retina normal. O.S.=Media clear, disc diagonally oval at 105°, hyperemic, margin well defined and regular, deep physiologic cupping, arteries normal, veins slightly engorged, macula and retina normal.

Nystagmus: During the ophthalmoscopic examination both eyes show some lateral nystagmus.

CASE 2. The patient is the younger

sister of Case 1. By request she was brought in for examination on November 22, 1921. In every respect her history and the condition of the lids and eyes are almost exactly like those of her sister.

V. O. D.=4/30, illiterate chart.

V. O. S.=3/30, illiterate chart.

Tho the vision of the right eye seems to be a trifle better than that of the left, patient uses her left eye almost exclusively because the left upper lid can be elevated more than the right. In the primary position she fixes with her right eye (Fig. 5). There is no external disease in either eye.

Fig. 3. Case 1. Fixing with left eye.

Fig. 4. Case 1. R. more deeply set and rotated down and out.

Pupil: The pupils are small and contracted. Light reflexes and reaction to accommodation cannot be elicited. Both pupils, however, show slight alternate contraction and dilatation when a pencil of light is thrown on the macular regions of the eyes. Under atropin both pupils are semidilated. The right pupil is round and is displaced upward and inward; its diameter is about 5 mm. The left pupil is also round and its displacement is more marked than that of its fellow; the direction is also upward and inward.

Eyeball and *ocular muscles*: This examination gives practically the same findings as in Case 1. Both eyes can turn inward slightly. The right internus seems to act a trifle better, but neither eye can aproach to the median line.

Ophthalmoscopy: O.D. Fundus normal except that almost the entire nasal border is fluffy; from this margin there are seen three greyish brush like radiations of medullated nerve fibers, running diagonally outward. Its longest radiation measures about 1 disc diameter. O.S. Normal.

Nystagmus: Right eye shows marked lateral nystagmus during the ophthalmoscopic examination. Left eye shows it slightly.

Retinoscopy performed on the right eye shows plus 6.50 at 90° meridian and plus 7.00 at 180°. In the left eye, plus 3.50 at 90° and plus 4.00 at 180°. Corrections based on the retinoscopic examination do not improve her vision, and the subjective test is unsatisfactory.

OPERATIONS.

On November 28, 1921, case 1 was operated under ether.

O.D. After exposure of the internal rectus, the tendon of this muscle was found to be thin and narrow. It was about 5 mm. from the limbus. The muscle was light in color, flabby, and appeared to lack tone. Reese's resection

in which 5 mm. of the muscle was resected, was performed.

O.S. After exposure of the internal rectus the insertion was found to be about 5 mm. from the limbus. A similar condition of tendon and muscle as that of the right internal rectus was found. Reese's resection of 5 mm. was done.

After the advancement of both the interni, the eyes showed only slight improvement. The left externus was then exposed. Its insertion was attached quite far back to the globe, being about 11 mm. from the outer limbus, and was almost opposite the outer canthus. The muscle fibers were pale, very thin, flabby, and few in number. Complete tenotomy was done.

Immediate results: The right eye was still much lower than the left. Divergence was slight.

On December 5, 1921, the patient was again operated under general anesthesia. The right externus was exposed. Its insertion was about 11 mm. from the limbus. The muscle was pale and flabby. It was completely tenotomized. The eyes appeared to be a little convergent. On the right upper lid Hunt-Tansley operation was performed.

On December 17, 1921, twelve days after the last operation, a study of the *results* was made. The previous width and the present width of both palpebral fissures were about the same. There was a slight eversion of the right upper lid at the lid margin midway between the canthi, due to overtraction on the skin of that lid following the operation. The right upper lid was elevated at each contraction of the occipitofrontalis muscle. The right globe was still more deeply set than the left (Fig. 6). It was considerably lower than the left and rotated a little down and out. The ocular movements were much restricted. Both eyes were nearer to the median line but were still divergent. Both eyes possessed a slight degree of abduction. The pupils were almost equal in size and were a trifle larger than originally.

Fig. 5. Case 2. Eyes in primary position. Fixing with R.

Fig. 6. Case 2. Fixing R. Lid raised by frontalis.

The displacement remained the same. Instillation of two drops of 1/4% eserin salicylat at an interval of 10 minutes did not produce a miosis.

On November 28, 1921, case 2 was also operated under ether.

O.D. The tendinous insertion of the internal rectus was about 5 mm. from the limbus and was thin and narrow. The muscle fibers were pale, flabby, and fatty. They were easily stretched and torn with slight traction of the hook.

Advancement was found to be impossible, so the openings in the Tenon's capsule and the conjunctiva were closed with sutures. The external rectus was then exposed. Its insertion was about 9 mm. from the limbus. It was small, thin, pale, and fatty. Complete tenotomy was performed.

O.S. The distance between the insertion of the internal rectus and the limbus was about 5 mm. The muscle was pale, thin, flabby, and tapering. A resection of about 5 mm. of the muscle by Reese's method was done.

Immediate results: Both eyes were fairly straight with possibly a slight overcorrection. A week after the operation the eyes became slightly divergent.

Fig. 7. Case 2. Fixing with left eye.

Fig. 8. Case 2. Lids drawn up showing divergent squint.

NEUROLOGIC EXAMINATION.

Neurologic report by Dr. Andrew H. Woods: "All other cranial and spinal nerves and centers are functioning. The mother notes no difference in their conduct from that of normal children. The older brother is normal. Another child (second of the family) had same eye trouble (mother's report.)"

"Eyes: This child (Case 1) and the sister (Case 2) both use each eye independently, and to secure upward vision, they raise the lid by unilateral effort of the frontalis of that side."

RESUMÉ.

1. There can be no doubt that the condition found in these patients is congenital. Three out of five children in one family were similarly affected at birth. It is interesting to note that they followed one another in succession. The first victim was a boy and the second and third were girls. Whether the condition is hereditary or not is a question, as neither of the parents seems to know much about their ancestors' eyes. My impression is that it is hereditary. The genealogy of a Chinese family, as a rule, is not kept. Those who do keep it usually record the merits and achievements of the family, rather than diseases and misfortunes. The parents' statement is entirely from recollection. It is quite possible that the disease may have skipped a generation or two.

2. On account of the bilateral character of the cases, they are probably nuclear in origin. The developmental defect of the oculomoter nucleus must have affected all the different ganglions. The fact that the interni possess a slight degree of function indicates the ganglions that control these muscles are partially intact. The pupillary center is also partly intact, for when strong light is directed

on the macular regions of the eyes the pupils show alternate contraction and dilatation, and they also responded to the action of atropin, even tho the response is slight. The nerve supply of the sphincter must also be partially intact, for instead of dilatation of the pupil we see in each eye a marked contraction. The explanation of the pupillary phenomena is not known, and any attempt to fix the exact mechanism

Fig. 9. Condition of Case 1 after operation.

Fig. 10. Condition of Case 2 after operation.

carries one into purely theoretic grounds. All we can say here is: 1. The lesion of defect is probably in the midbrain. 2. The resulting effect upon the dilator mechanism is inhibitory. Whether this is by paralysis of dilatation or stimulation of constriction is not known.

The nucleus of the trochlearis is undoubtedly absent or degenerated, for each eye fails to rotate down and in when the eyes are directed to look down to the right and down to the left. The eyes, however, cannot be turned in sufficiently to give the superior obliques their maximum action, but the fact that there is no power of depression at all is evidence enough of a complete paralysis of those nuclei.

The nuclei of the abducens are partially degenerated, as shown by the fact that the eyes possess some degree of abduction after the interni have been advanced. This was shown by the examination conducted on Case 1 on December 17. The faulty insertion of the externi, the years of disuse on account of the constant abduction of the eyes due to oculomotor palsy, are also causes which will bring about degenerative changes of these muscles. It is, therefore, difficult to determine whether or not the paresis is due to defective development of the nuclei, or to degenerative changes of the external recti muscles per se.

3. So slight is the action shown by the interni, and so slight is the response of the pupils to atropin in these cases, that they may be considered for all practical purposes unimportant in the diagnosis.

4. Operation on the ocular muscles for total ophthalmoplegia is not a success from the standpoint of cosmetics, fusion or improvement of vision. An attempt to fix the globes to the orbital contents in the primary position, in addition to advancement and tenotomy, may produce a better result.

5. Hunt-Tansley operation for the correction of congenital ptosis is, I believe, not satisfactory on account of the amount of cicatricial deformity resulting.

THE VISIBILITY OF CORPUSCULAR ELEMENTS WITHIN THE AQUEOUS.

ROBERT VON DER HEYDT, M.D.

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The character and currents of the normal aqueous are reviewed. Its corpuscular elements include leucocytes, pigment cells, erythrocytes, granules and other cell debris. Their movements indicate the currents in the aqueous. Increase of leucocytes shows uveal hyperemia, and of pigment cells indicates depigmentation. Their adhesion to the posterior surface of the cornea occurs on pathologic areas. Variations in these elements aid in prognosis.

The focal light bundle of the slit lamp discloses the normal aqueous as an optically empty fluid. Human aqueous, in addition to a small amount of sodium chlorid, contains a very slight quantity of albumin. According to Hagen, regenerated aqueous found after paracentesis is not richer in albumin, as has been supposed by deductions applied to humans from the findings of experimentation on animals. Rados and Elschnig have proven, that the refraction index of regenerated aqueous is the same as that of the normal.

The question of the derivation of newly formed aqueous in humans and in the lower mammalia after paracentesis is not fully settled. One observer claims it is a transudate from the vitreous thru the zonular area. This observation has been experimentally verified by Roemer. It is also well known that when vitreous humor is energetically centrifugalized, it will separate into its more solid structural elements and a fluid similar in character to aqueous.

Seidel, in his recent exhaustive experimentation on the circulation of intraocular fluids, claims to have proven the derivation of normal aqueous by a typic filtration process, and the ciliary body its source of supply. He and others have also proven a steady drainage of fluid from the anterior chamber into the episcleral veins in the normal eyes of animals.

A postlental space, filled with a fluid similar in nature to aqueous, positively exists. It is seen easily by means of the focal bundle of the slit lamp, an optically empty space anterior to the hyaloid membrane, and in it the physiologic hyaloid artery remnant can be seen usually. This remnant on motion of the eyeball is seen to sway freely within a fluid media. The latter, therefore, in order to allow of this must be of less specific weight, hence quite similar in nature to aqueous.

In iridocyclitis there is an increase of the albumin content of the aqueous. The regenerated aqueous after paracentesis in iridocyclitis contains less albumin, hence the reduction in tension after this procedure.

The addition of corpuscular elements, such as leucocytes, pigment cells, erythrocytes, granules and other cell debris, to aqueous, is plainly visible in the focal bundle of the slit lamp. This phenomenon may easily be studied and interpreted as to its clinical significance. These cell elements, when not present to excess in an otherwise unaltered aqueous, demonstrate the normal circulation of the aqueous humor within the anterior chamber. This possibility verifies the conclusions of Turk, who first demonstrated experimentally that the aqueous rises near the warm iris and descends near the colder cornea.

This is the normal flow and is not accentuated by the heat of the slit lamp as was claimed by Koeppe. These solid elements, by virtue of their visibility, plainly demonstrate this normal circulation of fluid.

I have studied this phenomenon in a great number of cases of very incipient uveal pathology. These were instances of recent ocular trauma, as well as a large number of cases of iridocyclitis in their very incipience. The latter cases would have been doubtful as to diagnosis at this early stage were it not for the definite visibility of this early deciding symptom. Later added manifestations of iridocyclitis verified these conclusions.

I have also at times noted the pres-

ence of stray leucocytes in the aqueous of normal eyes in youthful individuals.

Pigment cells or granules, singly or in small numbers, by virtue of their visibility within the aqueous, demonstrate the circulation in older persons. That they are pigment cells is proven by the simultaneous presence of many similar particles—now easily seen as being of chocolate color—adherent to the endothelial surface of the cornea, especially in its lower half. At times, they are seen in small numbers on the anterior lens capsule. This process is now definitely accepted as senile depigmentation, and observable in many eyes, in varying degrees of intensity, in individuals past middle age. Irides rich in pigment do not, because of this, show a greater disposition to this senile process; the phenomenon is observed quite as often in light colored eyes.

Posttraumatic and postoperative scattering of pigment in the anterior chamber is also a commonly observed clinical phenomenon. In iridocyclitis, exudative areas are rapidly covered by a pigment coat. The exudation stimulates its proliferation.

In these cases, where presumably the aqueous may be considered normal in character, one may study the rapidity of this current within the anterior chamber. The solid elements rise in a swaying motion, comparable to the slow floating ascension of toy balloons. The zone of ascension comprises approximately the posterior two-thirds of the depth of the aqueous, while the descent takes place in the anterior area near the posterior corneal surface.

In their descent these cell elements often attach themselves to definite circumscribed areas on the back of the cornea. Vogt has observed ameboid movement in them. Quite often these zones, predisposing to attachment, and first described by Krukenberg, are spindle shaped and vertical in position. They presumably are pathologic endothelial areas, and similar to such as are found posterior to circumscribed lesions of the anterior cornea. I have seen an instance of this in a case of herpes of the cornea, where at least fifty pigment cells were found attached posterior to the circumscribed lesion. That this was an area of predisposition to attachment was proven by the simultaneous presence of scattered pigment in other parts of the cornea, and also in the other normal eye—concomitant senile depigmentation going on in the eyes of this individual.

One may study the process of the absorption of small hyphemia by observing the quantity of cell debris in motion. At first, there may be rigidity, the blood elements are suspended in an aqueous increased in specific weight. These dots are always reddish, not a coloration of their own, but due to the blood tinged media in which they are suspended.

The study of corpuscular elements in the incipience of uveal pathology is of great interest. They are seen in all cases of traumatic, as well as in the iridocyclitis of endogenous origin. In the early stages of traumatic iridocyclitis, there is often a rigidity of the cell laden aqueous, and a very rich deposit of leucocytes on the posterior cornea and anterior lens capsule. The latter are visible only in the reflected image of the cone of light focused on the capsule. That these are leucocytes is not alone a probable deduction, owing to the nature of the process, but quite certain because of their uniformity in size. They are larger than red blood cells, which latter are so often seen under similar magnification, just passing singly along narrow newly formed blood vessels in corneas quiescent for years and decades after interstitial keratitis.

As absorption progresses a retarded circulation is noted. The leucocytes are seen to arise slowly in the posterior chamber area. This can best be seen in upper zones, as the cornea in this area is more transparent. Progression in absorption is evidenced by an increase in motility and a slow disappearance of cells deposited on the corneal endothelium. I have seen individual leucocytes, or their debris particles, within the aqueous in these cases of traumatic iridocyclitis for many weeks after all other clinical symptoms have subsided.

In cases of endogenous iridocyclitis, the incipience is characterized by a

fairly rapid circulation and a comparatively clear cornea. As the process advances, rigidity develops in proportion to the increasing solidity or viscosity of the aqueous, due to an addition of exudate derived from the blood and lymph.

The relationship between the number of deposited corpuscular elements on the posterior cornea and anterior lens capsule, and those within the aqueous, is a constant one. An intensified pathology at this stage often obscures further observation, at least thru the lower two-thirds of the cornea, because of the enormous increase of deposits on the same. In addition we usually have an added dew like infiltration of the corneal epithelium. Hypotonia may develop at this stage, manifested by a coarse wrinkling of Descemet's membrane. These processes interfere with the further observation of this, so interesting, phenomenon. The appearance of mutton tallow clumps may also complicate certain cases. Some cases go thru the disease without this development, tho these cases have not been isolated as to having an independent etiology.

Very often at a time when the corpuscular elements suspended in the aqueous are still visible in the upper chamber zones, one may note a slow return of motility. They begin to demonstrate a somewhat retarded return of circulation, and this development has a definite bearing on prognosis.

An amelioration of other clinical symptoms of the iridocyclitic process is a definite concomitant observation. I have repeatedly witnessed this coincidental improvement, one can almost sense it in the behavior of the patient. The increasing fluidity of the aqueous during the progress of this interesting disease is a safe guide as to favorable prognosis, hence of important clinical significance. During the course of a disease so uncertain in its manifestations and duration, it is selfevident that we may also experience sudden relapses and additional symptoms due to an increase in exudation.

A few words regarding the method of observing this interesting phenomenon of the circulation and suspension of corpuscular elements in the anterior chamber. The quadrilateral, sharply circumscribed bundle of light enters the eye diagonally from the temporal side, passing the cornea temporalward of the pupillary edge, and is focused onto the iris on its nasal half.

The diagonal area within the aqueous between these two luminous points, the temporal cornea and nasal iris surface in focus, is now open to inspection. The corpuscular elements within this aqueous zone may now be seen by focusing the microscope within this area, using the pupil as a dark background. Slight motion of the slit lamp from side to side on its vertical axis allows of a liberal lateral displacement of the illumination. A slight lateral rotation of the eyeball, or up and down, allows of the inspection of added areas of the fluid. The principle of observation is similar to that which allows of the visibility of dust particles in a narrow beam of sunlight entering a dark room—that of increased contrast. A magnification of 25 times is sufficient for the study of this interesting phenomenon.

CONCLUSIONS.

1. Corpuscular elements within the aqueous are easily visible and may be interpreted as to their clinical significance.

2. Depigmentation as evidenced by the liberation of pigment cells and granules, and their presence within the aqueous, on the lens capsule and posterior cornea, is now accepted as a definite senile process.

3. Pigment proliferation is stimulated by exudation in iridocyclitis.

4. Leucocytes within the aqueous denote the very incipience of uveal hyperemia.

5. By variation of the rapidity of their circulation they give evidence of the progression or retrogression of the iridocyclitic process.

6. These variations in flow are concomitant with and a measure of the fluctuation in severity of all other clinical symptoms of the disease.

7. The active circulation of the normal aqueous within the anterior chamber is established as an easily observable phenomenon.

THE BETTER SURGERY OF CATARACT EXTRACTION.

CHARLES B. MEDING, M.D.

NEW YORK, N. Y.

This paper reminds us of the disposition of oculists to write about the cataract operation. It calls attention to the real value and important influence of Col. Henry Smith's visit to America; and presents an argument for the use of different cataract operations in different cases. It holds up the removal of the lens in its capsule as the ideal. Read before the Buffalo Ophthalmological Club, May 10, 1923.

An examination of the usual papers, attention to the discussions their reading provokes, and a gentle but honest analysis of the actual operating experience of the speakers, is my best reason for this paper. In a recent contribution, the title of which promises novelty, two-thirds of the matter is a minute description of the preoperative attention to lids, conjunctiva and the patient's general metabolism. The kernel, of diminutive size, proposes a change of means for producing suction and a different shaped aperture in the instrument. Another long writing spends over one-half its length on reasons why other methods are unsatisfactory, and then with the imponderable evidence wielded by fifteen extractions shows how an insignificant manœuvre gave 100% success.

It seems to me that the voluminous cataract literature has had time enough to show that the factors of safety are largely in the grasp of the operator, while the dangers, either structural or dispositional, if I may so include conduct, abide in the patient. This personal equation is kaleidoscopic, and descriptions of the various combinations, however interesting to the narrator, never enrich the listener. They remind me of a little note-book I began at my graduation in which I carefully recorded "Valuable Prescriptions". They were listed clinically—you looked under B for Bronchitis and Boils and under E for Eye salve. The years showed me how futile it was to think of medicines in terms of disease, and in surgery I have lived to fear the hand that would meet emergency with catalogued maneuvres.

Practiced judgment and a nimble decision suffice the man who has fundamental knowledge of the body tissues and an abiding faith in the reasonable remedy, be it knife or drug. This is the little text I call my creed.

The results of cataract extraction, unmarred by accident, depend most on the section and the completeness of evacuation; in other words, accuracy of cut, thoroness of removal and speed of healing are indices of perfection. Whatever the method, these cannot be omitted and any modification demands the same initial skill. If this is so, choice of method would seem to depend on the requirements of the case, and not upon any particular affection or bias. To exercise judgment in selection, one should be familiar and if possible exercised in the various procedures; advance is unthinkable if the argument for and against a definite manual procedure be based on theoretic opinion alone. Thus, steam engine, telegraph, telephone and wireless were each called impossible.

One by one the various organs of the body have proved amenable to surgery, and accuracy, speed and method have been victorious. But there has been no regression anywhere as to the cardinal necessity of "complete removal of a foreign body, if at all possible, once it is attacked." Here, is the crux of cataract surgery. So large a percentage of all postoperative complication is due, absolutely and entirely, to the mixture of cut iris and remaining cortex and capsule, that other difficulties are insignificant. Wherever this combination is avoided, either by complete extraction or good fortune, cataract work is surgically dependable.

Each step of extraction—preparation, section, iris treatment, delivery and wound toilet—and each instrument necessary therefore, has at one time or another been of chiefest importance, and to stress this or that has been the sole intent of most writings. Nothing fundamentally new has appeared in my life time, except the Smith Method of expression and the variously claimed method of suction. In the reception

accorded these new methods, we have had not only criticism but repetition in multiple form of individual performances of the old, and it has seemed that many defend measures, not so much because of their value, as because they wish to prove of value what they employ. Some feel and speak as though it was meritorious to assist in the utter extinction of the new; but experience shows that the tincture of persecution is tonic even to evil, and that any note of jealousy or bitterness destroys whatever of value a criticism may contain.

We have recently had as visitors two eminent surgeons, champions of two extraction methods, Colonel Henry Smith of India and Dr. Barraquer of Spain.

The visit of Colonel Henry Smith was desired by his pupils as an opportunity for their expression of more than verbal appreciation of his Indian hospitality and teaching. Beneath this there was at large the hope, that his work would change the ophthalmologic atmosphere, first by eliminating some of the ancient liturgy of precedent, and secondly by insistence on the truth that surgery is surgery, in every field. His plain speech, natural force and enormous experience were adapted to influence those to whom ophthalmology seemed an inviolate inheritance for all generations; but it was the willingness to listen, to learn and to respect even this heritage that proved the more fruitful advance.

He travelled from New York to San Francisco, from Texas to Montreal. He operated under all conditions, voiced no preferences as to light, assistant, instrument, or bandage. The constant queries, diffident or challenging, met instant courtesy; criticism only suggested closer contact with the critic. The accident of the operation was never excused, nor the prejudice of observers suspected. The audible inspiration that greeted a drop of vitreous permitted a smiling operator to bid us tabulate the result with the prolapse. I overheard one New York gentleman remark after witnessing four poor operations—"Well, four operations, vitreous in three." "Just as I thought," said the Colonel when I told him. "Could the Gods have been kinder than to have given him just what he sought?" The record of the trip from the standpoint of work done has never been equalled. The performance of ten, twenty, forty and even fifty extractions without worry, fatigue or useless motion, demonstrated that the ophthalmologist has no more excuse for collapse than the abdominal surgeon.

The writer has made a determined, but futile, effort to collect the statistics of four hundred odd extractions, made en route from May to August. Probably some of the gentlemen addressed have not understood my purpose, a number preferred presenting their own group and have done so, and others failed because of inability to gather the facts. The purpose was, however, to intensify general interest in the work and by no means to present the usual cataract statistics.

The operation alone was on view and test. The operator traveled fast. He carried no instruments. He operated on eyes he had not examined, often going directly from train to operating room. The surgeon supplying the cases was accepted as data and assistant. No details of light or preparation were known. The crowd pressed close. The weather was hot, and the operation finished, the operator never saw the patient again. Surely there is nothing to report in the name of the surgeon but the operation. The unanimous effect was amazing. I gathered the facts concerning one hundred and fifty of these operations. Vitreous in two—rupture of capsule in four, with immediate extraction of same in two. Tho disappointed in the unfinished work, I am satisfied that even this partial summary advances my plea for selective surgery.

The exhibition over, the personality absent and the audience back in their fields and on their own, what is the harvest? Has the complacent gentleman, whom local reputation satisfies, dropped the "for my part I prefer my humble way" from his daily thought and felt the impulse to understand motives rather than criticise maneuvre?

This writer's lesson at the feet of this teacher, was "Don't copy movements, achieve my method; lend your mind and hand to accomplish the result, not to imitate technic." When we left the clinic in Philadelphia, Columbus or elsewhere, were we full of a new inspiration born of another's effort to help or were we satisfied to have witnessed a performance, parts of which we felt able to surpass? I believe the first happened oftenest, and that many younger men conceived the desire to get back to essentials and from these to seek a new advance. Visiting celebrities are not all so fortunate in their friends as was Colonel Smith. Too often, few have invitation to see, and the star is monopolized by an individual or group. The cataract clinics of the spring were quite otherwise, and the fruit of the big, intimate lessons, will I think, nourish the generation.

Much questioning of certain supposedly sacred customs is one sign. Many letters have been received, and here follow some of the commoner questions:—

Was not the original reason for operating but one eye at a sitting fear of infection?

If immature cataracts can be removed, why not operate both eyes at once?

Why do surgeons use the lance keratome, instead of a short stiff cataract knife, while they emphasize the uncertain keenness and difficult use of the keratome?

In iridectomy, why do surgeons strive to finish corneal section without disturbing iris, when they must immediately insert forceps to catch the iris?

Many have asked why the sawing cut? Why the conjunctival flap? Why the stitch and not the flap?

All these queries are inspired by a thinking teacher, a surgeon rather than a conventional eye doctor, and are encouraged by the teacher's operative familiarity with other ways. Avenues of thought are always blocked by antagonism. Intracapsular operations are the delight of the younger men. To prefer the beaten track is both credit and delight to those who have made it, but youth is impatient and the passing generation does better to indicate a new way to advancing feet than to systematically frown on any departure from the old.

I believe much of the conservatism peculiar to eye surgeons is due to the methods of teaching: methods in which much too great emphasis is placed on copying technic and escaping certain promised evils. However poor the description of eye operations, you may rely on a splendid chapter of accidents, in view of which few men have freedom of hand, wrist or brain left to prevent the thing their fear promised. The accidents following surgery of other organs are treated negligibly, but one's first acquaintance with eye work emphasizes the mishaps. It is, of course, true that errors correctable elsewhere may ruin the eye; that operations elsewhere save life, however they injure function, but the dangers of the slips and errors are intensified and their frequency exaggerated.

If the average man were carving an apple, opening an abscess, etc., he would have no difficulty in following suggestion; but with an eye he has antiarguments galore and dares not even try. Fearlessly he dips into the anterior chamber to pick up the iris, but he trembles if he essays to grasp the iris by gentle pressure of wound lips with forceps. He is taught to make conjunctival flaps, so he makes them; iridectomy is common, he adopts it. If he had not done so in his first hundred extractions and had kept records of worth, he could decide when and where each was most advisable. Instead habit rules, and all argument is post facto.

Again it cannot be that the eye should so differ from every other part of the body and from every other thing in the whole world that here, alone, the one way is always best. Indeed our profession exists because the treatment of human ailment cannot be stereotyped, but demands judgment based on case analysis. The first use of acquiring a new method is to perfect the old, most newer methods having been evolved because of the weakness or accident of the old. The mind can follow development more easily than it

can accept a finished product, hence star demonstrations of new methods frequently alarm and discourage by emphasizing differences. Colonel Smith emphasized the one big universally desired thing, removal of the entire foreign body, to this and not to his method we were bidden attend. Leaving the hundreds of cases to the care and judgment of men of many minds mattered little, if these minds had a high purpose.

Our second visitor, Dr. Barraquer, stresses Phacoerisis as a method of intracapsular extraction, and has introduced the erisiphake to produce the perfect suction. He has operated thruout the country, and many have witnessed his beautiful work.

The one unfortunate objection to the method, one no doubt exaggerated by the inexperienced, is the introduction of a possibly uncertain element between hand and lens. Many feel that even the assistant is a factor of danger in extraction operations. No matter how well trained, he is a second human element and one more possibility of error, but an assistant seems many times more reliable and cooperative than a machine. Aside from this, we are again confronted with successful intracapsular work with its clear pupil and freedom from inflammation. There is the dexterously made and accurate section and unhurried speed. Here is another surgeon indifferent to difficulty and deaf to the "good enough" chorus. Tho infatuated with his machine and unusually clever in its use, he yet considers it but another effort to attain the goal of the intracapsular extraction. He claims no perfection, and already appreciates that some cases are far more amenable than others to his way and means.

However we are moved by various methods and statistics, there are a very large number of failures to be seen in every eye clinic. Very evidently no boasted method saved them. The patient's history, however, very frequently gives a key to the possible cause of the failure; might not a wiser selection of method have helped? There are just two methods of cataract extraction, both with or without iridectomy, and it is a fact beyond question that neither is everywhere successful. Setting aside the question of skill, every surgeon knows how various are the conditions presented. Surely grasp and facility with both capular and intracapsular methods will arm us for their surgery. As suggestive of the practical application of selective, and therefore better surgery, the following conditions offer field for choice. They do not attempt to be exhaustive as to eye, operation or instrument, but they are the fruit of experience.

The capsular operation offers least difficulty:—

For hypermature, or discoid lenses.
In the prominent eye.
In extremely intractable patients.
Where one eye has been lost thru disease.
In eyes with increased tension.
In iritic hemorrhage.
Where dislocation is difficult.
After errors in technic, such as small section or wounded capsule.

Irrigation may be useful in any capsular extraction, but is valuable with immature lenses or wherever much cortical matter remains. I have thought that it increases the percentage of secondary operation.

The intracapsular operation finds no difficulty:—

In emaciated patients.
In deep set eye.
With immature and swollen lenses.
With easily dislocated lenses.
Where vitreous presents on section or before delivery.

Whatever the theories for and against iridectomy, we have every evidence that many cases do as well without as others do with it. If you knew just why, or just in which it could be omitted, would you prefer your own cataract operation with or without? Experience will show you that, at least in eyes with fully dilatable iris, you can safely omit iridectomy. There may be other contributing conditions but of this one I am convinced. In choice of instruments, likewise, I believe that for the capsular operations,

the capsule forceps and cystotome has each its best place. Certainly, in extremely shallow anterior chambers, the forceps is less apt to nick the iris. As to knives, it would seem reasonable to prefer one that had a keen point as well as a sharp edge.

Concluding, may we not ask whether men who cling obstinately to any one way are ever deft operators? Can it be that such men ever see either the insufficiency of their way or the possibility of its improvement? Does the sight of the new antagonize rather than inspire? Has the historic roll from Daviel down, with its story of struggle, no spur for him?

I believe the good surgeon desires, and good surgery demands, a working knowledge of every means. I believe that the splendid results obtained by pioneers with their new or improved methods is proof of the methods' superiority in numerous cases. It may seem unfortunate that their claims are sometimes too inclusive, but it is easier to discount enthusiasm than to possess it, and next to him who conceives new truth, stands the man who first and best acquires it.

THE RELATION OF FOCAL INFECTIONS IN THE PRODUCTION OF OCULAR DISEASE.

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The difficulty of discovering some focal infections that cause ocular disease emphasizes the interdependence of all parts of the body. In the thirteen cases here reported, only the insistence of the ophthalmologist led to operation and the preservation of vision. Read before the Virginia State Society of Ophthalmology and Oto-Laryngology, April, 1923.

This paper is written not to bring forth anything that is original, or to refute anything which has been written—its sole purpose is to set forth the facts concerning a group of cases of various ocular conditions, all of which have had as their cause some focal infection which could not be located except by careful examination; and in two of which, numbers nine and thirteen, the signs were so misleading that it was only the insistence of the ophthalmologist which led to operation and the preservation of vision.

As will be seen, the ocular conditions are variable in type and have no definite connection with the site of the underlying cause, very similar changes resulting from sinus, tooth and tonsillar infections.

If any one thing is impressed upon us by the facts here related, it would seem to be, that the human body is an entity and not a group of independent parts, and that trouble in one organ is frequently the result of disease elsewhere in the individual, that can be found only after painstaking search; and that the physician must not become so highly specialized that he regards the organ of his particular interest as isolated.

So recent is our knowledge of the relation of sinuses and teeth to the ocular structures, that it seems probable that in several of these cases the cause would not have been discovered had they occurred fifteen years ago, and the vision if not the eyes would probably have been lost. Several would have been attributed to syphilis, as many to tuberculosis and the rest distributed among the mysterious causes then assigned for such happenings.

CASE 1. Miss E. B. S., age 21, was seen on March 4, 1922, complaining of blurred vision of each eye. Examination showed no changes in any structure of either eye. O. D. V. was 5/10, the best corrected vision being 5/9 plus; O. S. V. 5/8 partly, capable of correction to 5/6. Examination of the visual fields showed normal peripheral limits with a relative central color scotoma, the diagnosis being retrobulbar neuritis. Physical examination showed a rather low blood pressure, 100-65, hemoglobin 68%, reds 3,250,000 and whites 5,000. Wassermann weakly positive, but no other findings. Ex-

amination of the teeth showed them in good condition. The tonsils had been removed and the sinuses were reported as healthy. Vision not improving under iodids, another rhinologist, Dr. Ross Hall Skillern, was asked to see the patient, and he felt that there was enough sphenoidal infection to account for the trouble. The sphenoids were drained and in six weeks vision was 5/5 plus in each eye.

Case 2. Mrs. W. L. H., age 42, first seen in 1906 and at intervals since then for refraction. On December 1, 1922, came complaining of a blur before O. D. Central and peripheral vision were normal and there were no fundus changes. Three days later central vision had fallen to 5/8, and there was a central relative scotoma for red and green. A diagnosis of retrobulbar neuritis was made. Examination showed a hyperplastic sphenoiditis of the right side, treatment of which caused a disappearance of the ocular symptoms. At no time were there fundus changes.

Case 3. Mrs. P. E. D., age 35, first seen in October, 1914 for refraction. On July 13, 1922, came complaining of blurring of vision of O. S. for the preceding ten days, during which time she had had a cold. The right eye was normal in all respects; the left eye showed no changes save for a central vision of 5/15, with a central relative scotoma for red and green. A diagnosis of retrobulbar neuritis was made, and examination showed involvement of the right sphenoid, which was opened. By August 9, 1922, the scotoma had disappeared and central vision was 5/5 plus.

Case 4. Mr. A. H., age 39, seen first December 27, 1915, for refraction. On April 26, 1921, he reported complaining of blurred vision of O. S. Examination showed O. D. normal in all respects. O. S. V. was 5/15, with a crescentric patch of retinal edema at the macula. Wassermann was negative as were the nasal passages and throat. Three teeth were found to have apical abscesses. Extraction on May 10, 1921 resulted in a subsidence of the retinal edema with a return to normal vision by June 10, 1921.

Case 5. Mrs. E. T. L., aged 60, reported on July 19, 1920, with a history that O. S. had been sore since the preceding day. Examination showed O. D. normal with a vision of 6/10. O. S. slight ciliary injection with two posterior synechia and a vision of 6/15. Examination showed normal urine, negative Wassermann, two teeth with apical abscesses and an involvement of the ethmoid cells. The teeth were extracted and the ethmoiditis treated by suction, the patient, however, not objecting to more radical procedure. This attack cleared up, but two months later O. D. was involved. In January, 1921, the left eye was again involved, which lasted, with short intermissions, until August of that year, when the left antrum and the ethmoid were cleaned out, with an almost immediate improvement in the ocular condition, and without return up to the present. Corrected vision is normal, and except for a few pigment spots on the anterior capsule of the lens, the eye is undamaged. One of the interesting things about this case was a sensitization to atropin after a long period of use and the necessity of using scopolamin; also interesting was the long dilatation of the pupil without increase in ocular tension in a woman of sixty.

Case 6. Mr. B. H., aged 25. First seen March 13, 1917, with a history that O. D. had been inflamed four years previously, with some recurrence at times. O. S. had been sore the previous week. O. D. was normal in all respects, with a vision of 6/5. O. S. showed intense ciliary injection, with a cloudy cornea, the pupil filled with exudate and a slight hypopyon; vision being perception of hand motions at one foot. The eye had been under indifferent treatment. Under suitable local and general measures, conditions improved so that in four days the exudate in the pupil was absorbed and vision was 6/25. The Wassermann was negative, the teeth were in good condition but the sphenoids were infected. On April 27, 1917, a hemorrhagic retinitis developed in O. S. which treatment quieted, the nasal treatment consisting in the use of the suction apparatus. In June the right

iris became inflamed, but the attack was light. In August, 1918, O. S. was again involved, the iris being so congested that there were hemorrhages from it into the anterior chamber, leeches being required to lessen the iritic hyperemia; a similar attack occurred three months later. In December, 1919, a retrobulbar neuritis with central scotoma and some edema of the disc appeared in O. D., vision falling to 6/30, to return to 6/5. Radical operation has been refused tho he has had several ocular inflammatory attacks, each aborted by nasal treatment.

CASE 7. Mrs. E. S. S., aged 30, seen first June 30, 1921, with a severe iridocyclitis of O. S., O. D. being normal in all respects with a vision of 5/5. O. S. had a vision of 5/60. Local treatment was prescribed, and nasal examination by Dr. Seth A. Brumm showed the left nasal cavity in bad condition, with the ethmoid probably involved, and X-ray examination by Dr. George E. Pfahler showed a cloudy ethmoid. Operation confirmed these findings, with almost immediate improvement. By July 15, 1921, two weeks after the first visit, the eye was white and vision normal.

CASE 8. Mrs. A. H. C., age 30, was first seen February 15, 1915, for refraction. On December 7, 1915, she again reported, this time with an inflamed right eye, which went on to a severe iridocyclitis with much K. P. and iris engorgement. Physical examination including a Wassermann was negative, but nasal examination showed a septum deflected to the right with acute infection of the ethmoid and sphenoid cells. They were treated, and by December 27, 1915, the eye was white. On August 1, 1919, there was another outbreak in the same eye and again intranasal interference was required, with prompt relief, the eye being clear in two weeks. A third attack started December 19, 1923, with much congestion of the iris and chemosis of the conjunctiva. Pus was obtained on opening the ethmoids, and by January 2 the eye was again almost white, with normal vision.

CASE 9. Mrs. C. C., age 33, was first seen on February 3, 1923, with a right eye which had been sore for about twelve hours. There was considerable corneal haze, and ciliary and iritic congestion, the vision being 5/10. O. S. was quiet with a vision of 5/5. Teeth, Wassermann and general physical examination were negative. She was seen by three rhinolaryngologists, all of whom said the sinuses were negative but the tonsils were badly infected. Following an expression of infectious material from the tonsils the eye greatly improved, seeming positively to point to the source of infection. The tonsils were removed February 9, 1923, and the eye became worse, the pupil filled with exudate, cornea densely hazed and the conjunctiva so greatly chemosed that it overhung the limbus; vision at this time was scant light perception. In addition to the other local remedies, leeches were applied to the temples with no great relief.

On February 14 there was a small hypopyon. Consultation was again held with the laryngologist, Dr. Ross Hall Skillern, who could still find nothing to suggest sinus involvement. The eye continued in its severely inflamed state, and on February 18 the writer insisted on amputation of the right middle turbinate, which was done by Dr. Skillern the following day, when there was found in the sphenoid a thin blood tinged serous fluid. In forty-eight hours the improvement in the eye was most remarkable, the cornea being clear enough to see that the vitreous was quite hazy. In three days more the vitreous was clear enough to see that the disc and retina were quite edematous. Improvement, however, continued, and in four weeks from the nasal operation corrected vision was normal.

CASE 10. Mr. N. W. B., age 26, first reported on August 1, 1922, complaining of blurred vision of O. S. for the preceding twelve days, without pain or other symptoms. O. D. V. was 5/5 and this eye was normal. O. S. V. was 5/25 without external changes. The vitreous was quite hazy and there was a large patch of exudative choroiditis to the nasal side of the disc and about twice its size. It was

believed to be either syphilitic or tubercular. Specific infection was denied and a blood Wassermann was negative, physical examination was negative and tuberculin injections gave no reaction. The teeth were in good condition. Nasal examination showed that the sphenoids and posterior ethmoids were the site of a low grade inflammatory process, and they were drained on August 24, 1922. By September 5, 1922, vision was 5/10, and by September 29 the vitreous was quite clear, vision was 5/5 and the choroidal patch quiet.

Case 11. Dr. E. B. K., age 27, had been refracted first ten years ago. On January 30, 1923, he reported that O. S. was tender and that there had been some photophobia. Examination showed some slowness of pupil activity but no other changes. On February 3 there was some congestion and the following day some K.P. as well as a linear infiltrate into the lower portion of the cornea. Blood and urine were negative, von Pirquet negative, Wassermann negative, sinuses negative, one apical abscess at root of lower left second molar tooth, cultures from tonsils showed streptococcus viridans and staphylococcus aureus. The tooth was extracted and the tonsils treated, cultures from the tooth showing streptococcus viridans. On February 12 the eye was distinctly better and went on to complete recovery by February 28.

Case 12. Miss E. B. V., age 17, was first seen on October 27, 1923, with blurred vision of O. D., which had then lasted for two weeks. No other symptoms. O. D. V. was 5/35 with a large central scotoma, the disc was hyperemic with some blurring of the temporal margin. O. S. V. 5/5, the eye being normal. Wassermann and von Pirquet tests negative, sinuses, blood, urine and teeth negative, but the tonsils were badly infected, and were immediately removed. On November 4, O. D. V. was 5/15, the disc still being swollen with a complete macular wheel. By November 24, O. D. V. was 5/5 and the fundus was normal except for slight hyperemia of the disc and one or two "spokes" remaining of the macular change. Central color vision was normal.

Case 13. Mrs. M. B. W., age 52, seen on January 23, 1917, complaining of blurred vision of O. D. with pain in the right frontal region following influenza. O. D. V. was limited to counting fingers at 2 ft., the direct pupil response was abolished but consensual reaction was good, a condition which was reversed in the left eye. The right disc was hyperemic with blurring of the margins. The left eye had normal vision, full field and no changes except the loss of consensual pupil activity. Dr. George B. Wood could find no signs of sinus involvement, and X-ray examination by Dr. H. K. Pancoast was negative, but so plain did the underlying cause seem to be that the sphenoids were opened on the writer's insistence on January 28, 1917. Almost at once an improvement in vision was noticed, and by February 2, 1917, vision of O. D. was 6/20, and one week later corrected vision of this eye was 6/6.

These cases may be divided into three groups according to the site of the original focus, or into types of ocular involvement, in which case four groups will result, and it has seemed well to select this second classification. We then have group one, where there was an acute uveitis of greater or less intensity, to which six of the cases belong; five resulting from sphenoidal or ethmoidal involvement and one from a tooth root abscess. Group two, of retrobulbar neuritis with four cases, all due to sphenoidal involvement. Group three, with two cases of retinochoroiditis, one due to sphenoidal hyperplasia and the other to a tooth root abscess, and one case of neuroretinitis with tonsillar infection as the cause.

From this analysis we see that there is no definite connection between the site of the original infection and the type of the ocular inflammation, and that a diagnosis of the ocular disease will not, per se, enable us to locate the original infection; but a complete physical examination is the only reliable method of procedure. It will be realized from a study of the cases in group two, that at times this type

closely simulates the condition of tobacco-alcohol amblyopia, and may be very difficult to differentiate from that condition. It seems quite probable that some of the tobacco cases, in which in spite of the cessation of the use of the toxic agents the visual defect persisted, were also affected by unrecognized sinus involvement, and therefore naturally were not cured by the removal of the influence of the tobacco and alcohol.

As to the method of the production of this type of neuritis by sinus disease, two views are held; one that it is an actual neuritis due to the seeping thru the thin bony wall of the sphenoids of toxic material from the sinuses, and the other that it results mechanically from pressure on the nerve. Of these theories the former seems to the writer to be the more probable.

The course of transmission is either by continuity of tissue involvement, thru the lympathic or thru the blood stream.

Retrobulbar neuritis from sphenoid or ethmoid involvement is an example of the first method, uveitis from sphenoidal infection, of the second and neuroretinitis from infected tonsils of the third.

The most important item of the treatment, after the source of the infection has been localized, is its radical removal. Palliative treatment by vacuum or suction apparatus is, in the writer's experience useless, and to be avoided, unless there is a very definite contraindication to more radical proceedings. Nothing but good has followed the opening of the sinuses in any case which the writer has seen, and he believes that in case of doubt this should be done.

When we come to consider the proportion of these various groups which are caused by focal infection, we find no reliable figures. Formerly we believed that the greater number of cases of iridocyclitis were due to syphilis, tuberculosis, gonorrhea or rheumatism, now it seems that at least one-half of the cases of this condition or of uveitis are due to localized infection, and this estimate is probably too low, and we now know that there is no such entity as "rheumatism."

Retrobulbar neuritis was "tobacco-alcohol amplyopia," or from some similar toxemia. Of this condition it would seem that at least two-thirds the cases are from sinus disease, and many of the remainder are complications of disseminated sclerosis.

Retinochoroiditis is still probably most frequently due to syphilis or tuberculosis, and only in an occasional instance does it result from focal infection, as in Case No. 10 of this series

The two needs which it is hoped this paper has shown are first a prompt and complete physical examination; and second as thoro a removal of the cause as is possible.

STUDY OF THE OCULAR MOVEMENTS IN THE HORIZONTAL PLANE.

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CHICAGO, ILLINOIS.

In seeking to determine the center of rotation of the eyeball, an instrument was devised by means of which the point at which the optic axes cross during horizontal movements of the eye may be accurately localized with relation to the corneal vertex. Observations with this instrument show an eccentric rotation of the bulb with the center of motion about 15 mm. posterior to the apex of the cornea and 1.5 mm. nasalward to the visual axis. Older observations regarding movement are only approximate.

The following paper is a dissertation on research work on the nature of ocular movement. Dr. George was led to undertake this investigation in the hope of perfecting an accurate operative procedure for the correction of squint. Operative work based upon the assumption that the center of motion lay at the center of the eyeball led to faulty results. A cursory investi-

gation of these inaccuracies caused Dr. George to assume that the center of motion lay at or near the posterior pole. He further reasoned that it would be anatomically impossible for the optic nerve, at its juncture with the eyeball, to move a distance equal to that of the cornea during an extended excursion of the eye. In the hope of arousing constructive criticism and further investigation by others, a paper on this subject was presented in 1912. Adverse criticism of this paper prompted further investigation, of which the following is a recital.

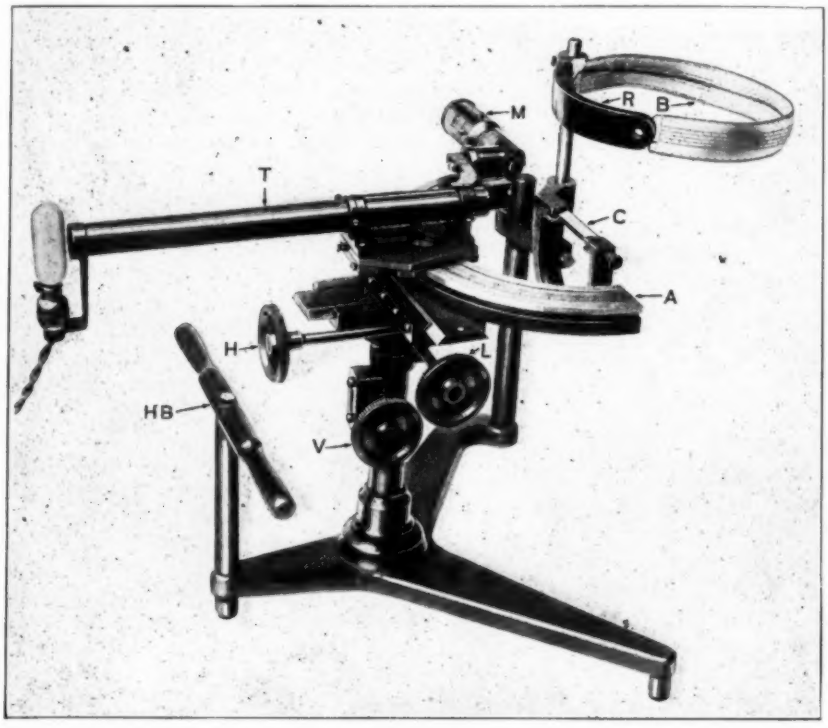


Fig. 1. Instrument for determining accurately the position of the center of rotation.

In 1914 the services of Mr. C. C. Allen, an optical expert, and superintendent of the Geo. S. Johnston Co., Chicago, were enlisted to design and construct an instrument for determining with accuracy the position of the center of motion.

The work of Donders, later corroborated by Tscherning, appeared to us to be complete, but the methods employed led us to doubt the accuracy of the findings. After much experimentation and several alterations in construction, the instrument shown in Figure 1 was finally completed. The basic principle of this instrument, which we have named the ocular kinemometer, is the determination of a point within the eye thru which the visual axis of the eye shall pass at all times during any excursion in the horizontal plane. *This point is not the center of motion, nor is it fixed in relation to the structure of the eye, but is fixed in space with reference to the instrument.* Donders' work presumed the corneal vertex to move along a circle the center of which was the center of motion, located upon the corneal axis. This we have found to be incorrect, and the method of disclosing this error will be shown in connection with a description of the instrument.

Figure 1 shows an arc A, graduated in degrees from zero at its center to 90 degrees at each end, mounted upon two slides which lie at right angles to

each other. By turning the proper hand-wheels, the arc may thus be moved toward or from the subject or across his line of vision. The arc and slides are mounted upon the upright post of the base and may be brought to the proper level, or height, by the hand-wheel upon the post. The center of the circle upon which the arc is drawn we designate as the point O. The arc is fitted with a sliding carriage upon which the tube T is mounted. For any angular position to which this tube is moved along the arc, its axis will coincide with the radial line drawn from the point O at that angle. In other words, the axis of the tube will always point toward the arc center O for any

FIG. 2

Fig. 2. Appearance of needle as seen in the center of the slit.

position of the tube along the arc. As the subject looks along the axis of this tube during an examination, there is placed at the end of the tube proximal to the eye a very narrow vertical slit, and at the distal end a fine vertical needle. The centers of the slit and needle intersect the axis of the tube, and the subject's visual axis therefore coincides with the tube axis when the needle appears in the center of the slit, as shown in Fgure 2. An electric lamp behind the needle serves to illuminate the needle and slit, and a blue color screen furnishes practically monochromatic light, by virtue of which the effects caused by the color aberration of the eye are eliminated as well as glare due to the brightness of the unscreened lamp. Attached to a vertical bar erected upon the base is a forehead rest R, against which the head of the subject is held by the band B, while, at the same time, his teeth are firmly closed upon the wood bit C′ (the Helmholz bit) held in a U shaped clamp extending under the chin. The subject's arms extend over the base, his hands grasping the handbar HB. In this manner the head of the subject is held rigidly in a fixed position during the examination.

As previously mentioned, we have discovered that there is a point fixed in space, lying within the eye, thru which the visual axis passes during an excursion of the eye in the horizontal plane. The arc center O is likewise a fixed point in space in relation either to the instrument or the head of the subject. As the head is held firmly in

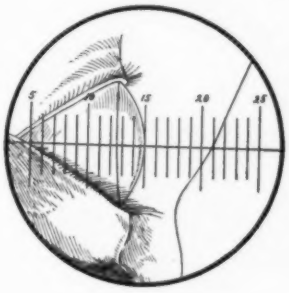


FIG. 3

Fig. 3. Showing measurement of distance of corneal apex from the "fixed point O," the center of motion of the eyeball.

the instrument, it is clear that a coincidence of the arc center O with this fixed point in space provides a convenient means for locating this dual point within the eye. Obviously there is but one part of the eye from which the position of this point on the visual axis can be measured accurately, namely, the corneal vertex. We shall henceforth term this dual point the point O. For measuring the position of this point O posterior to the corneal vertex, there is mounted upon a bracket, extending from the tube T, a microscope M which focuses upon the cornea. The axis of the microscope lies at an angle of 90 degrees from the axis of the tube T, so that the corneal vertex may be observed at a right angle to the visual axis. We have found the point O to lie about 15 millimeters posterior to the corneal vertex, and the microscope is therefore mounted so that its axis lies 15 millimeters anterior to the arc center O. Within the microscope is a graduated micrometer scale, the central gradua-

tion of which is marked 15, which graduation is coincident with the axis of the microscope. Figure 3 shows an observation where the point O lies 15 millimeters posterior to the corneal vertex.

In practice the head of the subject is fixed in position as above described, his hands grasping the handbar. The tube T is next moved by the hand-wheel V until the eye looks approximately along the horizontal plane of the tube axis. With the tube placed at zero on the arc, the hand-wheel H is next used to bring the slit and needle into alignment, as shown in Figure 2. The visual axis now coincides with the axis of the tube at zero. We next move the tube to and fro along the arc between about 30 degrees nasalward and 30 degrees templeward, and find whether or not the needle remains in the center of the slit during such movement. If, as the tube is moved nasalward or templeward from zero, the needle passes from view on the side of the slit toward zero, the point O lies too far posterior to the cornea, and if, under the same procedure, the needle passes from view at the opposite edge of the slit, the point O lies too near the cornea. The arc is next moved toward or from the eye, as the above procedure may indicate, by the hand-wheel L, until a position is found where the needle remains constantly in the center of the slit during several to and fro movements of the tube. The visual axis now passes thru the point O for all angular positions to which the eye is turned by the same angular positions of the tube.

If, after the above adjustment, the corneal vertex were to remain stationary upon the micrometer scale of the microscope during such movement of the tube along the arc, a position of the center of motion upon the visual axis would be positively indicated. *We find, however, that this is never the case.* In several hundred observations of many different subjects, we have found that the eye invariably advances when turned nasalward and recedes when turned templeward. An average of fifty typical observations upon a number of subjects during a period of nearly two years gives the positions of the corneal vertex anterior to the point O as shown in Figure 4. Figure 5 shows these findings graphically. From the point O the lines of the visual axis are drawn ten degrees apart. Upon these lines (at x along the curve c-c) are indicated the positions of the corneal vertex, and assuming the length of the visual axis to be 23 millimeters, the corresponding positions of the macula are indicated at x along the curve m-m. From the positions of the nodal points, 7 millimeters posterior to the corneal vertex, are drawn the lines of the corneal axis, c-a, which intersect the lines of the visual axis at x, along the curve n-n, at an angle of 5 degrees (the angle alpha). An effort to locate a point equidistant from the seven corneal positions x was unsuccessful, but between these positions at

Templeward.				Nasalward.		
30°	20°	10°	0°	10°	20°	30°
mm.	mm.	mm.	mm.	mm.	mm.	mm.
14.05	14.49	14.72	14.98	15.25	15.57	15.84

Fig. 4.

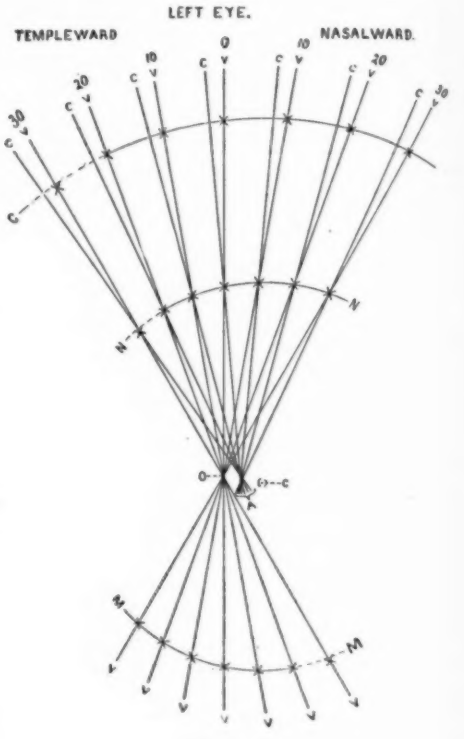


Fig. 5. Graphic record of increase of distance of O from vertex to cornea on turning the eye toward the nose.

30 degrees nasalward and 20 degrees templeward, a point C was found to be very closely equidistant from the position of the corneal vertex over this excursion of 50 degrees. At 30 degrees templeward the corneal vertex lies about 1/5 millimeter nearer the point C, which indicates a greater rate of recession of the eye beyond 20 degrees templeward. This point C is, then, the center of motion of the usual movements of the eye. Its average position is 15.4 millimeters posterior to the corneal vertex and 1.65 millimeters nasalward from the visual axis.

From the above it will be seen that *this position of the center of motion may be considered a fixed point for any excursion of 50 degrees* above mentioned, but that *after passing 20 degrees templeward this point is no longer fixed, but becomes a variable.*

Assuming the optic nerve at its juncture with the ball to lie 4.5 millimeters from the macula, the cornea, during an excursion between 30 degrees nasalward and 30 degrees templeward, moves 15.86 millimeters, while the optic nerve juncture moves 9.73 millimeters. This relatively small movement of the optic nerve juncture as compared to that of the cornea serves to support our earlier belief. The center of motion is, therefore, excentrically located nearer the posterior pole, and toward the nasal side about twice the amount assigned by Donders.

Donders assigned to the center of motion a position upon the axis of the cornea, but disclosed no reason therefor. His method made use of an ophthalmometer consisting of an arc graduated from zero at its center toward either end. At zero on the arc was a telescope, the axis of which intersected the arc center, our point O. The eye was thus observed from directly in front of the subject thru the telescope. Briefly stated, his method consisted of measuring first the horizontal diameter of the cornea, next determining the axis of the cornea by directing the subject to look at the primary sight movable along the arc, until the corneal axis was found by the mires overlapping each other half their diameters. The angle between the corneal axis, which thus coincided with the axis of the telescope, and the visual axis was called the angle alpha. From this primary position, the subject was next directed to look alternately at movable right and left sights placed at equal angular distances from this primary sight, until the alternate margins of the cornea coincided with a "vertically stretched wire" placed just before the eye. The position of the center of motion was then computed by multiplying the half diameter of the cornea by the cotangent of the angle between the primary sight and the right or left sight, "the angle of motion," which gave the distance of the center of motion posterior to the corneal chord. To this was added a fixed amount, "2.6 millimeters", as the depth of the corneal segment which gave the position posterior to the corneal vertex.

As stated above we doubt the accuracy of the results obtained by this method of Donders, by reason of its complication and the use of factors which must be absolute if accuracy is to be obtained in the observations and ensuing calculation. The corneoscleral juncture, the limbus, is a diffused zone about one millimeter wide (Salzmann.) The corneal margin does not, therefore, present a clear, sharp line of demarcation at its juncture with the sclera, but rather a zone of gradual blending from the transparent cornea to the opaque sclera. The corneal diameter cannot, therefore, be measured accurately, nor can its margin be brought into absolute coincidence with a wire for this reason. The depth of the corneal segment of different eyes certainly varies, and an effort to make use of a fixed value, 2.6 millimeters, for all eyes must result in error. If Donders were correct in assuming the center of motion to lie upon the corneal axis, there could be no advancement nor recession during the excursion. On the other hand, we have found the center of motion to lie toward the nasal side of the corneal axis. This necessarily results in advancement of the eye when turned nasalward and a recession when turned templeward with respect to either the visual or corneal axes.

The reasons assigned above for sus-

pecting error, together with the fact that Donders' observations were made thru a telescope placed directly in front of the subject, renders a detection of such an advancement or recession impossible by his method. Were the corneal margin a sharply defined line, so that its diameter could be measured accurately and coincidence of its margin with a wire as accurately observed, another feature of Donders' work, or lack of it, would demand consideration. While he made use of a movable "primary sight" and movable "right" and "left" sights (the latter for finding the "angle" of motion upon which the computation is dependent), no mention is made of means for securing coincidence of the arc center with the center of motion, as determined by him. It is clear that noncoincidence of these two points would result in an incorrect reading of the angle of motion, and the subsequent computation would consequently be erroneous. No mention is made of a movable part or an adjustment for securing such coincidence. The single statement "in front of the eye to be examined a horizontal graduated arc was applied with an arbitrary radius described from the center of motion of the eye" is the only statement which might apply to this subject. This placement of the arc center at the center of motion of "the eye to be examined" throws no light on the subject. One could scarcely place the arc center at a point subsequently to be determined. For these reasons, we believe the method of Donders to be too complicated and to lack that degree of accuracy necessary for an exact determination of the position of the center of motion.

Our method is both simple and direct. After locating the arc center, the point O, at the proper position posterior to the corneal vertex by the method before described, readings of the position of the corneal vertex anterior to this point are made at zero, 10 degrees, 20, and 30 nasalward in turn (returning next to zero as a check reading to see that this reading remains the same). 10 degrees, 20 and 30 templeward are next read, and finally a second check reading at zero as before. The positions of the corneal vertex are thus found for each ten degrees over an excursion of 60 degrees.

The position of a point equidistant from these positions, with slight variation beyond 20 degrees templeward, can then be found easily by triangulation or graphically. This point is the center of motion, and while we have found that this point is not equidistant from all positions of the corneal vertex over this 60 degree excursion, yet from 30 degrees nasalward to 20 degrees templeward it is equidistant within very close limits. Beyond 20 degrees templeward, the recession is more pronounced. We do not overlook the possibility of error in the position of the point O by reason of the fact that fixation at the macula occurs not at a point, but rather upon a small area. Tscherning gives the diameter of the fovea as 2/10 to 4/10 millimeters, the area upon which fixation takes place being much less than this. He states, for example, that the image of the moon is about equal in diameter to that of the fovea, but that we are conscious whether we fix upon one or the other edge of the moon. We believe 2/10 millimeters to be the maximum diameter which can be assigned the area of fixation. Were fixation made upon one or the other margin of this area, the visual axis would then lie .055 millimeters, .050, and .045 respectively from the point O when turned to 30 degrees nasalward, zero, and 30 degrees templeward. This amounts to an average of about 1/3 degree. An excursion of the eye over this 1/3 degree would show a variation of the position of the corneal vertex relative to the point O of only .015 millimeter, an amount too small to affect the accuracy of our readings.

MEASURING THE DEVIATION OF A STRABISMIC EYE ON THE STEREOSCOPIC CAMPIMETER.

RALPH I. LLOYD, M.D.

BROOKLYN, N. Y.

The uncertain line of fixation of the deviating eye complicates the measurement of strabismus. The relation of the blind spot to the fovea being permanent, mapping of the blind spot with the stereoscopic campimeter, first with fixation by the good eye and then with fixation by the amblyopic eye, the difference in position of the blind spot indicates the amount of strabismus. Cases illustrating the value of this method are given. Read before the Brooklyn Ophthalmological Society, April, 1923.

While the results obtained by the various operations for correcting strabismus are generally good, some benefit will result if our measurement of the deviation is more exact. I am sure that all who operate these cases get varying results from the same operation done with apparently equal satisfaction on several cases, all of which seem to have about the same deviation as measured on the perimeter.

Those who have devised operations for advancement and recession have endeavored to associate with some degree of constancy an advancement or resection of so many millimeters with a change in the final eye position of a certain number of degrees. Say what we will about splitting hairs or refining pure gold, the fact will not remain in the background, that there is something missing in our present method of measurement which is necessary to even allow us to begin to make definite deductions as to what results will be, as to how much we can correct in any single operation of whatever kind we may have in mind, and finally, as to what relation, if any, exists between a tendon resection of say 5 millimeters and the final position of the eyeball. For the sake of clearness, the example of muscle resection in the preceding sentence is used, but included in the idea should be all muscle changes of whatever kind.

A careful consideration of the perimetric method of measuring the deviation will first impress us with the basic principle that the visual and not the optic axis is the proper line to locate, because it is the only constant one of the two. It is the one nature uses. The eye which is fixed upon the disc in this test is certainly using the visual axis, so the error present is associated with our location of the image of the flash in the center of the pupil of the deviating eye. We are actually trying to find the optic axis, and this may be located outside the visual axis or may coincide. Practically, the aim is to locate the image of the test light in the center of the pupil, but this does not coincide in most cases with any of the lines mentioned. It is evident, then, that the line from which we make our deductions regarding the deviating eye is hardly a fixed one. Some will say, it makes little difference whether the measurement is accurate or approximate, inasmuch as the final result in

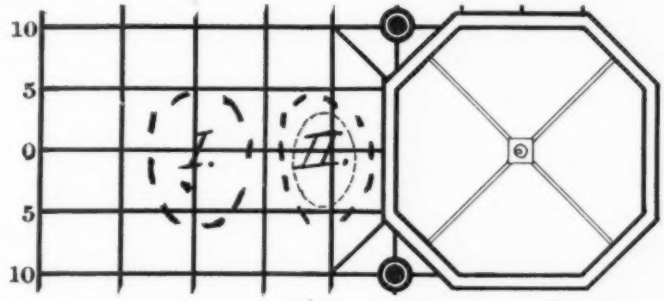


Fig. 1. Boy aged 11. Perimeter gives 27. Left divergent strabismus. The deviation as measured on the campimeter slate is 9. No. I, Blind spot recorded with right eye fixing blind spot; II recorded with left eye fixing.

muscle operations is in nearly every case a cosmetic success and not binocular vision. If the eye looks to be straight and does not attract attention, the success is not to be questioned.

But it would not seem possible to forecast results or plan operations along other than very general lines, unless we can eliminate the constant error which is certainly present in nearly every case according to the usual way of doing it. Most cases of convergent strabismus measure 25° on the perimeter, and this is certainly not assuring. In strabismus one macular area is of uncertain behavior and cannot be counted upon. If we could get a fixed point in each eye, our results ought to be very much more accurate. There is no fixed point objectively, but by using the Stereoscopic Campimeter, the blind spot of either eye can be mapped out and a fixed point is obtained.

The patient fixes in the apparatus with the good eye, the poorer eye deviates; both blind spots are then mapped out using a half degree, white test object. The good eye is then covered and the poor eye fixes, and the blind spot of this eye is then mapped out and will be found close to 15° external to the fixing point. The difference in the position of blind spot No. 1 and blind spot No. 2 of the deviating eye is the accurate measure of the deviation. Some will at once say that the poor eye can not fix, but by using an octagonal outline on the chart, with the poor eye fixing, as it were, upon a negative spot, very good results are obtained, as shown by the blind spot coinciding with the position known as the usual location and indicated upon the chart. You may wish to know how the perimeter and this method agree and a few comparions will be made.

CASE 1. Perimeter gives 10° left esotropia. Campimeter gives 18°.

CASE 2. Perimeter 30° left exotropia. Campimeter 10° left exotropia. This case was operated upon and perfect result obtained by one operation, (Lancaster advancement with tenotomy of opposer.)

CASE 3. Perimeter gives 27.5° left divergent strabismus. Campimeter gives 9°.

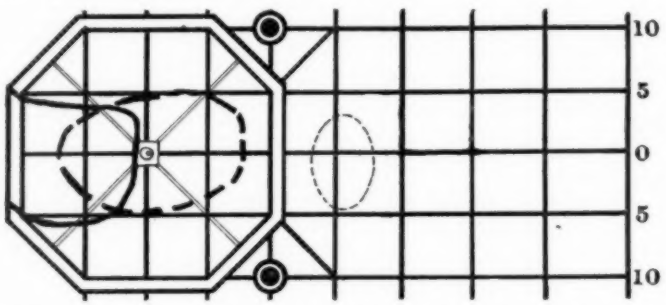


Fig. 2. Right convergent strabismus of 9. No apparent deviation. History of cross eye in early life, which corrected itself. The field for ½ red test object is used but the blind spot method of No. 1 is preferable. Continuous outline recorded with left eye fixing and outline of dashes with the right fixing.

There are many cases coming to the office for refraction which are not supposed to have other than binocular vision, but careful examination will show that about 16% of patients do not have binocular vision either part or all of the time. One of the defects of our routine office procedure is the absence of a test for binocular vision at both near and far point. By the method just described, it is easy to show just how much deviation there is present and whether the patient has binocular vision or not.

CASES MEASURED.

CASE 1. Mr. S. says that his right eye turned in when small, but that he has recovered. To all intents and appearances, both eyes are in use, but the right blind spot travels 8° when the fixing eyes are changed.

CASE 2. Mr. K. has irregular astigmia from corneal ulcers in infancy, but

each eye is improved amazingly by its proper glass. With confidence, we gave him his prescription, and he soon returned very much dissatisfied because the glasses would not work. Retesting finally showed that he was comfortable only when he used his right eye with correction and the left eye deviated 9° inward on the Campimeter. He was corrected for the right eye and the left correction reduced, in order to allow this eye to resume its secondary role.

and vision of ability to count fingers at three feet. The field of vision for small test objects was then outlined and proof of the result plainly shown.

CASE 2. Mr. L. operated for left divergent strabismus, and the result of the operation works out on the basis of color field as within a degree or two of perfect. The blind spot is, however, a more satisfactory and quicker way of doing any of this work.

In doing these tests, it has appeared that suppression of an image is accom-

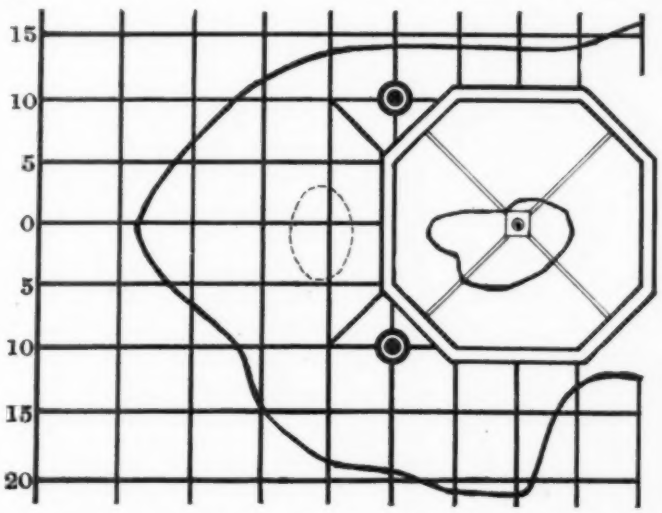


Fig. 3. Position of eye after operation as shown by the field for ½ red and ½ white test object. The presence of a small, central, absolute scotoma accounts for the poor vision, fingers at 3 feet. The perimeter indicated 25. Left esotropia but no measurement was taken on the slate. The blind spot is a better fixed point to use than the color field to measure the deviation of the squinting eye.

More cases like these could be given but they are sufficient. The function of the test to prove operation result will be offered next.

OPERATIVE CASES.

CASE 1. Miss V. is unable to take up training as a nurse because one eye deviates 25° on the perimeter. She was operated on for left convergent strabismus by the Lancaster method; and on the instrument found to have, after the operation, a central scotoma, which accounted for the poor fixing power,

plished by moving the eye, so that the image which appears on the macula of the better eye does not fall upon the macula of the poorer eye. As little as six degrees seems sufficient to accomplish the object.

Anything which blurs the image of one eye may cause a deviation. This may be corneal astigmatism of the irregular type or a scar. Positive scotomas also seem to do the same thing and the effect of injury to the macular area is very quickly seen.

DIVULSION OF OPTIC NERVE DUE TO PROJECTILES PASSING THRU THE ORBIT BEHIND THE GLOBE.

HARRY VANDERBILT WÜRDEMANN, M.D., F.A.C.S., SC. D.

SEATTLE, WASHINGTON.

This rare accident leaves appearances of the eyeground that may be very puzzling. The plates producing such appearances with a brief account of the two cases in which they were observed are here published. Read before the Puget Sound Academy of Ophthalmology and Oto-Laryngology, May, 1923.

In the Ophthalmoscopic Atlas of War Injuries by Felix Lagrange, there are described but one case of partial and four of total divulsion or tearing out of the optic nerve from the globe.

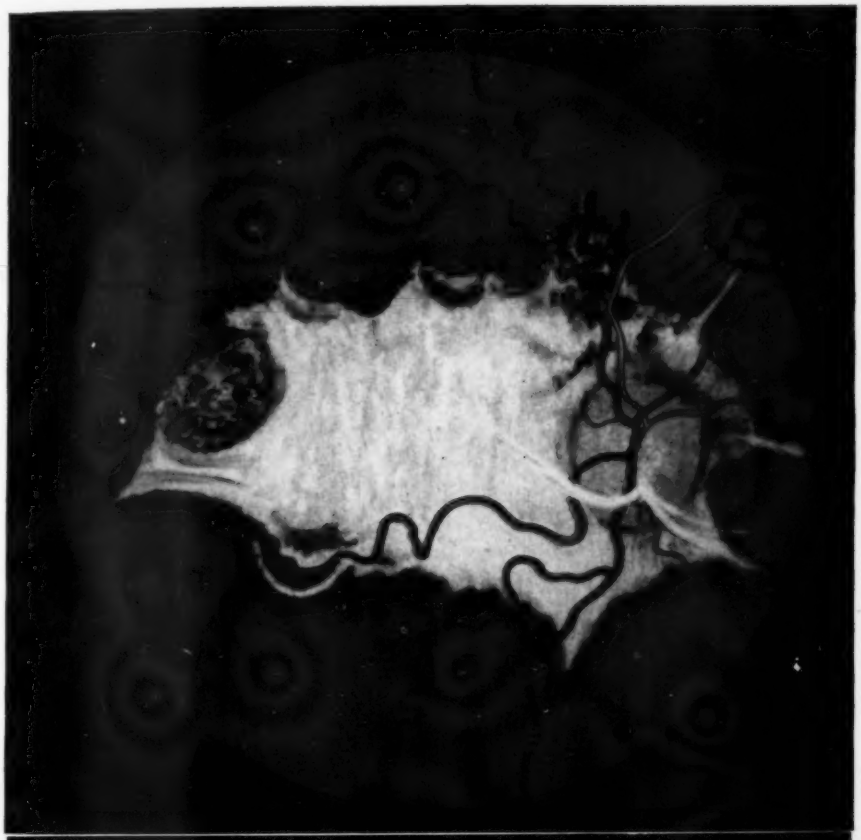
It may be interesting to observe the ultimate fate of such eyes as evidenced in the two cases herewith reported and pictured in the colored plates, in both of which the media remained clear and the external appearances of the eye were normal, despite the serious injury and total blindness resulting from the traumatism. Hence the two case histories with accompanying illustrations are given.

As Lagrange groups his cases, he shows that a missile passing thru the orbit may not directly touch the eyeball, but in addition to the injuries of the extraocular tissues and adnexa the optic nerve may be directly lacerated, cut and violently contused; also that by the traction effected upon the nerve by the missile and the pull of the tissues which are carried along by its force, the optic nerve may be detached and pulled out from the eyeball, being violently forced in the direction followed by the projectile. In fact this condition is more demonstratable than one in which the nerve has been more gently injured, if this word may with propriety be ascribed to any form of injury. In such cases, however, it may be followed by a consecutive papillary atrophy and I believe that I have seen such incidents.

CASE. 1. *Partial divulsion of the optic nerve with fairly extensive rupture of the choroid and retina.* S. L., aged 23, Sergeant of infantry, in the Argonne received an injury from a spent machine gun bullet, which passed thru the temple downwards, penetrating the antrum on Nov. 7, 1918. It was removed from the antrum at the evacuation hospital. When seen in my service at Camp Lewis, Jan. 28, 1919, the vision was equal to large objects down and out Ophthalmoscopic examination showed there was a most extreme choroidal rupture with partial divulsion of the nerve, the choroid being torn entirely away from the disc. The disc was focused at —8, the uninvolved portion of the fundus being hyperopic. There was retinitis proliferans in the lower part of the disc, the inferior temporal artery being obliterated. The patient was seen after his discharge from service at my office, April 25, 1922, when the appearances were the same. Bulky pigmentary masses are seen around the edges of the rupture; the veins are tortuous and there are no very small vessels present.

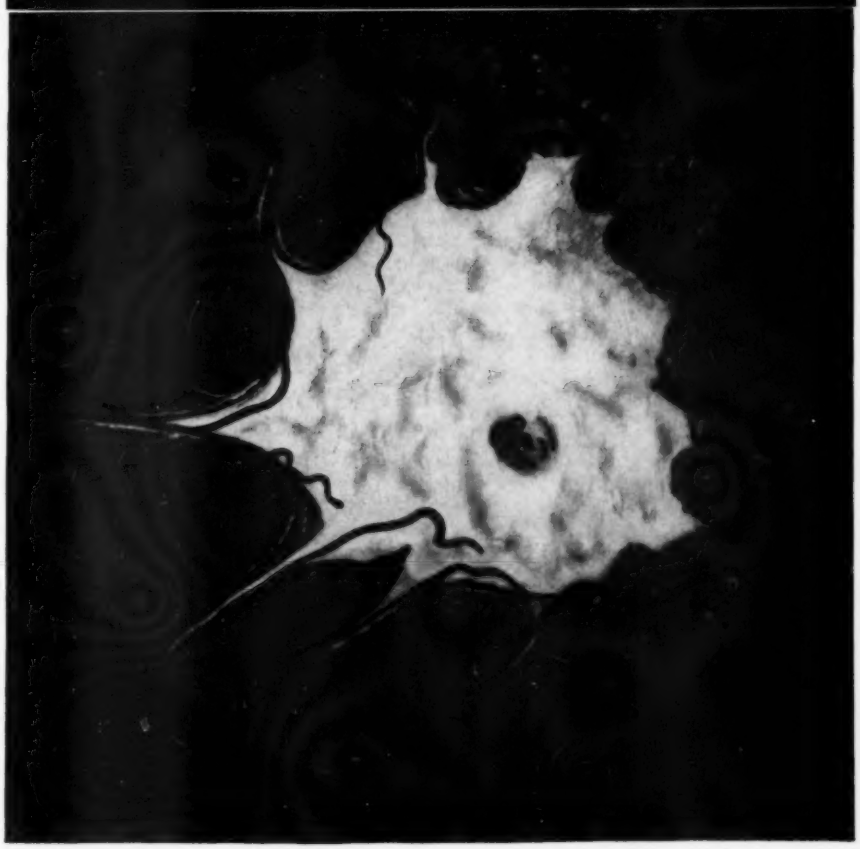
CASE 2. *Total divulsion of the optic nerve.* W. R., aged 40, Jan. 15, 1923. Two years ago had attempted suicide by revolver held at right temple. The ball passed across and thru right frontal sinus, coming out at the bridge of the nose. He then held the revolver to his left cheek firing upwards. The ball passed thru the left malar bone grazing the upper frontal. The left eye is totally blind from traumatic cataract, total posterior synechia and atrophy of the bulb. The right eye is normal to external appearance, the media are clear. There is perception of light only. Ophthalmoscopic examination shows the nerve entirely torn away from the globe by either direct injury from the ball or from the stretching of the nerve in its passage, or perhaps from a piece of bone being carried along. There is a deep pit in the region of the disc, and in the depths, about 8 D— is seen a small pit in which loops of vessels appear. There is an extensive choroidal and retinal rupture, which has obliterated all except a few either new formed or remains of retinal vessels. The rupture has many prolongations, and there is extensive deposit of pigment at its edges and at the upper part of the fundus.

It is to be noted that neither of the cases have any opacity of the media; that they are both quiet at two years after the injury and apparently normal eyeballs have been retained.



CASE 1.

PARTIAL DIVULSION OF OPTIC NERVE AND RUPTURE OF CHOROID AND RETINA



CASE 2.

TOTAL DIVULSION OF OPTIC NERVE (WURDEMANN'S CASES.)

NOTES, CASES, INSTRUMENTS

BEGINNING PANOPHTHALMITIS. INTRAGLUTEAL INJECTION OF MILK AND SUBCONJUNCTIVAL INJECTION OF MERCURY CYANID.

JOHN GREEN, JR., M.D.

ST. LOUIS, MO.

A. P. F., male, age 29 years, was struck in the right eye by a fragment from a steel shaving machine. The accident occurred at 1:45 p. m., December 30, 1921, and the patient was seen three-quarters of an hour later. R. V. 6/5. The ophthalmoscope revealed a small foreign body in the anterior part of the vitreous, a little to the nasal side and below the horizontal plane. To obviate any possible error in ophthalmoscopic observation, an X-ray picture was made which confirmed the ophthalmoscopic diagnosis. The wound of entrance was in the sclera about 7 mm. down and temporally from the corneal limbus.

Operation: The wound of entrance was slightly enlarged with a Graefe knife and the foreign body readily extracted by the Sweet magnet. It measured 2x1 mm., shaped like an Indian arrowhead. The scleral wound was covered by a double overlying flap of conjunctiva. After atropin 1%, the pupil dilated widely. An occlusive dressing was applied and the patient was sent to the hospital and put to bed. Urotropin gr. viiss was ordered every four hours. He was also ordered 5 gr. of calomel and a saline purge. At the first dressing, January 1st, the eye looked well but the pupil had contracted somewhat. Atropin 1% was instilled and the eye bandaged. About noon he began to have pain which slowly increased during the afternoon. I saw him at 8:30 p. m. and found the eye watery and painful, pupil contracted, anterior chamber cloudy and vision reduced to hand movements at 3 ft. The bandage was removed, atropin 2% and dionin 3% was ordered, and ice packs were applied several times during the night.

January 2. Quite severe pain. Aqueous more cloudy. Now a ring of fibrin on the anterior lens capsule; the pupil is only slightly dilated, tho the dilatation is better than the night before. A small hypopyon and increasing chemosis made it quite certain that the eye was developing a panophthalmitis, which view of the case was shared by Dr. Wm. F. Hardy, who saw the patient in consultation at noon. The wound of entrance showed no signs of infection. I injected subconjunctivally 20 minims of Hg. cyanid 1/2000 to which morphia gr. 1/4 had been added. 10 c.c. of bottled milk, which had been boiled four minutes, was injected deep in the buttock. The injection had to be interrupted to clear the needle of milk coagulum. Locally, atropin, dionin and hot boric packs. Temperature rose to 101.4° accompanied by aching of muscles and headache. There was the usual reaction, with pain, from the cyanid injection, which was controlled by morphia gr. 1/4.

Jan. 3. There is a great chemosis, but the pupil is fairly well dilated. At 3:00 p. m. injected 15 c.c. sterilized milk, after removing the milk coagulum by filtration thru sterilized gauze. Temperature rose to 102.4° and patient was very nervous and uncomfortable during the night. Local treatment continued.

Jan. 4. Dilatation better. Hypopyon gone. Eye feels sore but not painful.

Jan. 5. Gluteal injection, 12 c.c. boiled milk in buttock.

Jan. 6. Right, vision fingers at 1 ft. Good, but not wide dilatation. Patient remained in the hospital until January 13th. General treatment: Calomel gr. 1/10 t. i. d. Saline purges every other day. Locally: atropin, dionin, silvol, hot boric packs.

Jan. 14. R. V. = 1/50. Dim reflex with ophthalmoscope.

The subsequent course of the case has been marked by steady improvement. On January 28th, R. V. = 1/20. In the lower anterior part of the vitreous is an ovoid grey mass, fixed. Above the mass the vitreous is diffusely cloudy, with here and there a few larger shreds. Disc and vessels can now be made out, faintly. Atropin

continued. General treatment: Syr. Acid Hydiodici 5ii. t. i. d. Saline catharsis every other morning, and electric light baths two or three times a week.

Feb. 15. Atropin discontinued.

Apr. 15. R. V. = 6/30. Disc and vessels clearly visible. Grey mass in vitreous smaller and general vitreous haze diminished. Eye perfectly quiet. Patient was seen by Prof. Fuchs, who pointed out the possibility of late detachment of the retina, thru traction on this membrane by fibrous bands.

Mar. 28, 1923. At the present writing the media are clear. There is a small fibrous mass in the retina adjacent to the disc. From the upper pole a fibrous string emerges, encircles the upper border of the disc and terminates in the retina above the macula. The former site of the foreign body is occupied by a small oval grey mass, from which a fibrous string extends to the lower margin of the disc. Vision = 6/15.

A DOUBLE PTERYGIUM.

ARTHUR G. BENNETT, M.D.

BUFFALO, N. Y.

A. M., a German aged 61 and a pronounced myope, consulted me about an inflammation of his left eye. He said it had been reddened for several years and a source of discomfort. On examination I found on the nasal side of the right eye what appeared to be two pterygia, the upper one overlying the lower. The head of the lower had encroached on the cornea further than the upper one, but both extended well into the pupillary area. I advised removal. On Jan. 9, 1923 I transplanted them by the McReynolds method, the upper one under the conjunctiva above the cornea and the lower one below. They had a common base well towards the canthus, but divided at about 4 mm. from the limbus from which point they were distinct and separate. The healing was uneventful and the stitches were removed on the fifth day.

Fig. 1. Double pterygium. Bennett's case.

BILATERAL GLIOMA OF THE RETINA. REPORT OF CASE.

L. B. BUSHMAN, M.D., AND
CHAS. M. SWAB, M.D.
OMAHA, NEBRASKA.

M. D., white, male, age five and one-half months, was brought to our office April 11th, 1923, to determine if vision were present. The mother stated that this child was her only child, there having been no other pregnancies. The mother also stated that both she and her husband are in good health. Venereal infections were denied.[1] There was no history of serious eye trouble, malignancy or tuberculosis in the family of either parent. The patient was a full term child, being delivered by employment of low forceps. Soon after birth, that is, while the mother and child were still in the hospital, the mother says that she noticed the baby's eyes did not seem right to her. She observed that the baby's pupillary reflexes were whitish or yellowish in color, that the pupils seemed always dilated, and that the eyes jerked constantly.

General Examination: In its general makeup the child appeared quite normal. There was no evidence of over development, or of other faulty development. According to the mother the baby has gained in weight, slowly but consistently, and has always been strong and healthy. The child sleeps well and does not cry as tho it were in pain. The head did not impress us as being out of the ordinary, either in size or in shape.

Ocular Examination: The eyes appeared to be somewhat sunken, altho the orbits were but little less than filled. There was no response of the eyes when exposed to light or to bright colored objects held before the eyes. The conjunctivae appeared normal. Corneae clear. Both anterior chambers were uniformly shallow. Pupils were large, six millimeters in diameter, reacted sluggishly to light. There were jerky or nystagmoid movements of both eyes in a vertical plane. The lacrimal apparati appeared normal.

On April 13th, under ether anesthesia, the following data were obtained: The pupillary reflexes were grayish in color. Slightly posterior to the lens, a retinal detachment was noted, upon which small vessels coursed without interruption. The opaque veil (detached retina) was in a plane parallel to that of the iris. Upon moving the eyes there was no fluctuation. The details were studied as satisfactorily by oblique illumination as with the ophthalmoscope. The discs could not be seen. The tension was forty-four millimeters in each eye, determined by the Schiötz tonometer. Transillumination was negative when transilluminator tip was placed behind the equator of the ball.

While glioma of the retina is bilateral in twenty per cent of cases, yet it cannot be considered as common even among ophthalmologists with extensive practices. For this reason, we have felt justified in making this report.

It has been our good fortune to have our findings and diagnosis corroborated in this case by Dr. Harold Gifford of Omaha, and Dr. D. C. Bryant of Los Angeles.

The parents were told of the child's blindness and likewise of the probable result of such a tumor.

The enucleation of both, or of either eye was refused. The case is being treated by means of deep X-ray and radium radiations. If the case remains under our observation for a sufficient length of time, we shall report the result of the irradiation treatment.

The clinical record of this patient at St. Joseph's Hospital shows that a blood Wassermann reaction was reported on the fifth day following birth. It was negative by both the incubation and ice box methods.

OCULAR TROUBLES CAUSED BY INFLUENZA.

S. B. MUNCASTER, M.D.
WASHINGTON, D. C.

Influenza can be traced back in literature to an epidemic in 412 B. C.

The worst epidemic I ever experienced was while studying in Vienna in

1889 and 1890. At that time they had special sections of the hospitals set apart only for influenza patients.

Coal tar products were used to such an extent for treatment, that the law allowed the druggists to dispense only a certain amount unless on a prescription from a physician.

Influenza bacilli or possibly streptococci attack the system thru the air passages, and if the system fails to resist the germs a fever follows, and all know the general result, which we term influenza.

Instead of going into detailed description of each disease that may result from influenza affecting the eye, I will state some of the diseases that may follow; conjunctivitis, iritis, optic neuritis, orbital cellulitis, insufficiency of the muscles, ulcers of the cornea; sinuitis frequently follows and at times with serious results.

Influenza infection not only causes trouble directly by infection, but indirectly weakens the system, so that other germs and their toxins, as streptococci, staphylococci, or pneumococci, act as secondary agents giving rise to many complications.

I will give a description of an influenza case that has caused me to write this paper. I was called in consultation by Dr. Harry Hurtt in 1918 to see a patient who had been at death's door with influenza. On examination I noticed a swelling of the conjunctiva of about one-third of the eyeball on the nasal side of the left eye, and redness of the conjunctival membrane. The eye was sensitive to light and the tears flowed freely, but no pus. He complained that the vision was not as good as in the other eye. The next day, with the pupil dilated, I discovered some change in the vitreous on the nasal side, resembling a drop of milk in the vitreous. The third day the whole of the vitreous I could see was mixed with pus. After treating the eye for a month I found the tension below normal and the sight gone. The eyeball looked about the same as the other except from the pus in the vitreous. The anterior chamber was clear with nothing but the aqueous fluid. The treatment was atropin sulphat, some antiseptic drops, and hot applications. I watched the eye for five weeks to see if any sympathetic trouble developed in the other, but everything was normal.

He had to leave for his home in Boston, so I told him to see his specialist in Boston, and after one month to ask him to write me how the eye was getting along. I received a letter from Dr. Frederick E. Cheney, stating that "Mr. W. T. W. from Boston, who has been under your care, came to me to-day. From the history and present condition I judge he had a metastatic ophthalmitis. At present the eye is quiet. The iris is fairly good color and the tension is subnormal. I should be interested if you could write me if the trouble began in the uveal coat, or in the retina." I wrote to him that my opinion was that the infection was thru the uveal tract, as I noticed pus first from the nasal side, where the swelling of the conjunctiva began. The metastatic condition of the eye took place in one month. A normal tension changed to subnormal during the month. Where the influenza weakens the tissues of the eye to such an extent that infection can take place, causing ulcers of the cornea, attacks of glaucoma, and other dangerous diseases, immediate treatment is necessary to save the eye. I have had to apply the cautery to the deep seated ulcers of the cornea to prevent the spread of the disintegration. In cases of glaucoma, an eye may be destroyed in a few days if not properly treated.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly scientific papers and discussions, include date of the meeting and should be signed by the Reporter or Secretary. Complete papers should not be included in such reports; but should be promptly sent to the Editor, as read before the Society.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY.

Meeting of February 19, 1923.

DR. M. M. CULLOM, President.

Optic Neuritis from Sinus Disease.

DR. J. J. FREY presented the case of Mrs. A. A. E., aet. 36, who first consulted him October 23, 1922, with the following history: Has complained of dimness of vision for three days past.

Examination: R. Eye: V = zero. L. Eye: V = 20/200. Dilated pupils; optic nerve discs presented a mottled appearance, with more or less retinitis. Faucial tonsils diseased. Discharge from frontal sinus, which was dark upon transillumination. Wassermann negative. X-ray showed diseased teeth.

Treatment: Nose packed with 20% argyrol for two days; afterwards sprayed with 20% argyrol three times daily. Discharge about ceased on Dec. 13, 1922. Tonsillectomy October 28th. The first left upper central incisor, left upper first and second bicuspids, and lower molar were extracted. Potassium iodid, nine grains daily. On November 3, 1922 the vision of each eye showed improvement, which continued until December 13, when the vision of the right eye was 20/30 and of the left eye 20/20.

Discussion. DR. E. B. CAYCE had seen this case at its worst. The fundi were the most hopeless he had ever seen, to recover anything like normal vision. There were large hemorrhagic spots around the macula region in both eyes, especially the left; the area now shows the extent of the marked changes. In his opinion such cases serve to illustrate the point that no matter how hopeless the condition, one is justified in doing everything possible to remove every source of infection. He believes that the patient should be given the benefit of every doubt. He recalled a symposium on cyclitis held in Minneapolis, during which the point was driven home that eye diseases are usually per se only local manifestations of systemic conditions, and that any patient with cyclitis should have a general examination, and especially an ear, nose and throat examination.

DR. M. M. CULLOM: Such cases make one realize how much more can be done now for patients than formerly, and how much importance focal infection has in these conditions. He believed that Dr. Cayce's conclusions were absolutely just, that the most eye conditions are symptoms rather than local troubles, the result of some focus somewhere in the body, and that success is dependent largely upon locating such foci and eradicating them.

DR. FREY asked for advice as to the future management of the case. He reported that there had been some little disturbance in the right eye for the past day or so. It was his idea to put the patient again on iodid, and keep watch for further infection about the teeth.

DR. JNO. W. MOORE was of the opinion that while it is eminently correct to emphasize the elimination of focci of infection, yet, on the other hand, he has seen cases in which this view was adhered to too closely. He gave, as an illustration, the case of a woman whom he had recently treated, who had retinal hemorrhages of unknown origin. The changes were somewhat suggestive of nephritis, altho not altogether characteristic. A general physical examination was negative, except that the tonsils seemed involved. A tonsillectomy was advised, but declined. In the meantime she was given a subconjunctival injection of the cyanid of mercury, and the vision improved, in the course of a month or six weeks, from 20/200 to practically normal. The point he sought to make was that while foci of infection should, of course, be eliminated, yet he regarded the subconjunctival injection of the cya-

nid of mercury as a most valuable adjunct in the way of local treatment. He would not hesitate to use such injection in this case.

Sympathetic Ophthalmia.

Dr. Hilliard Wood showed the case of Mr. C. B., aet. 26, who first consulted him on December 27, 1904, giving the following history: Right eye was cut by knife three years ago; ball opened; atrophied stump resulted. Left eye developed sympathetic ophthalmia a month or two following accident.

Examination: Right eye: Atrophied. Vision zero.

Left eye: V. 8/200. Shows result of old sympathetic ophthalmia; iris practically atrophied; pupil small and immovable; many synechiae; gray plastic film across entire pupillary field.

Treatment: Right stump enucleated. Parents advised to place child in Tennessee School for Blind.

Sept. 11, 1906. Vision of left eye somewhat improved. Inserted artificial eye right side.

Dec. 15, 1916. Left eye: Recently vision has apparently been failing, and eye feels uncomfortable. Examination shows left eye vision 8/200. General ocular condition same as in 1904. Tension 15 mm. hg.

Jan. 1, 1917. Left eye: Em. V. 20/200.

March 7, 1919. Left eye: Relapsing iritis; moderate irritative symptoms. ℞ atropin sol. and salicylat soda tablets.

Feb., 1923. Left eye has been inflamed and painful past 30 days. Examination shows acute relapse of iritis in left eye. Left antrum suspicious by transillumination; irrigation shows no pus.

Faucial tonsils septic. Tonsillectomy under local anesthesia.

Discussion. Dr. E. B. Cayce called attention to the fact that current literature contains much regarding tuberculous infection of the eye. He referred to a recent article in the American Journal of Ophthalmology, in which the author advances the theory that the vast majority of cases of sympathetic ophthalmia are tuberculous. He believes that this patient should be given the tuberculin test. According to Finnoff, minute doses should be given, and too much attention should not be paid to the temperature chart or the general reaction of the patient, but rather the local reaction of the point under suspicion. In this case the eye should be watched. In case the tuberculin test should prove negative, Dr. Cayce would suggest that some of the hormones, or thyroid extract, be used.

Dr. J. J. Frey said he noticed one impacted wisdom tooth which, according to the patient, had been giving some trouble. He advised the extraction of this tooth, together with the X-ray of the remaining teeth.

Dr. E. L. Roberts emphasized the wisdom of looking into the dental condition in cases of this character.

Dr. Herschel Ezell thought, that while the points which had been brought out were of great value, and all physical defects should certainly be corrected, yet, assuming that the patient could be gotten in perfect physical condition, the treatment would not be complete unless something could be done for the eye itself, looking towards the improvement of vision. The condition presented was one of exclusion and occlusion of the pupil, with atrophic iris. The question is, can any operation be done which will improve the vision? In his opinion about the only operation which would be of value would be an iridectomy, but he doubts whether this could be done successfully, as it is not known what changes have taken place behind the iris, i. e., whether they are favorable to vision. He would not, however, undertake an operation without first explaining to the patient the uncertainty of the result.

Dr. M. M. Cullom believed that the chances were if an iridectomy were done and the opening would fill with exudate, the eye would be in a worse condition than before operation, and an enucleation probably be required. In his opinion one would be taking very grave chances by any operative interference. He has had remarkable re-

sults in opacities of the cornea by the use of dionin and yellow oxid salve (1%), and while he does not know that this salve would be of great benefit in this particular case, yet he would be inclined to give it a trial, as it might stimulate the circulation of the eye, bring more blood there, and carry away some of the exudate. He inquired whether the sinuses had been X-rayed.

DR. WOOD said that while the left antrum did show a slight shadow by transillumination, there were no other evidences of empyema, and no X-ray of the sinuses had been made.

Symblepharon and Pannus.

DR. HERSCHEL EZELL showed the following case: Mr. L. L., aet. 21, insurance agent, who first presented himself Jan., 1920, giving a history of injury to the left eye some ten years previously by explosion of a can of lime. The eye remained inflamed for about a year, and the vision has since been blurred. Examination at that time showed symblepharon of the lower lid, for which Dr. Ezell did an operation, with the result that the condition considerably improved. At the present time the right eye has vision of 20/20, and is normal. The left eye has vision of fingers at six feet; iris responds to light and distance; cornea covered with scar tissue, which is of uneven density. In presenting this case, Dr. Ezell sought an opinion as to the advisability of operation for the removal of the scar tissue on the left eye.

Discussion. DR. HILLIARD WOOD said that while this case presented a number of the features of trachoma, yet he did not believe it to be trachoma on account of the fact that it was unilateral, and the cornea did not present the appearance of a trachomatous pannus. His experience has been that jequirity is of great benefit in trachomatous pannus, and while he does not know that it would be of value in this condition, yet he would recommend that it be given a trial. He thought any operative interference contraindicated, unless it should be peritomy after the method of Fox.

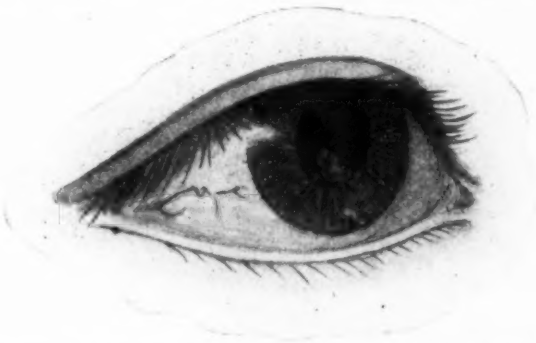


Fig. 1. Steel in eye showing exudate and pigment migration. (Cayce's case of siderosis.)

Fig. 2. Details of lesion shown in Fig. 1, with pupil dilated.

Steel in Eye.

DR. E. B. CAYCE presented the following case: Mr. W. H. F., aet. 26. Right eye: Five years ago was injured, and the foreign body by X-ray reported to the patient to have gone entirely thru the eye and to be lying in

adispose tissue of the orbit. In a few weeks the eye cleared up and the vision has remained normal for five years. Only three weeks ago, patient was in Chicago working for one of the railroads, and found vision becoming dim in that eye. He saw the railroad ophthalmic surgeon, who told him nothing could be done.

On examination the eye presented a wound in the iris, in the lower portion, near the outer edge; and under homatropin, adhesions were found in that region and a yellowish area, which it was impossible to differentiate from a siderosis or a migration of pigment—probably there was some of each.

Fundus examination: In the lower part of the fundus, a little below nervehead, about one diameter distance, was found a choroidal degenerative area, with migration of pigment outward and a pigmented area near the nervehead. These findings rather concurred with the history, that a foreign body had pierced the eye, entirely thru. An X-ray of the eye with a Sweet's localizer by Dr. H. S. Shoulders showed the foreign body 1 mm. below horizontal plane of cornea and 4½ mms. to the temporal side, vertical plane of cornea.

After the eye had been anesthetized with butyn following the use of atropin for 24 hours, when a giant magnet was brought in contact with the iris, it was seen to move forward, and after several efforts, there was a slight bleeding in the region of the iris wound. It was impossible to bring the foreign body thru the pupil, as the iris in that region was adherent to the anterior lens capsule. At the beginning the pupil was widely dilated, but after several attempts to draw the foreign body thru the iris, the pupil contracted down to normal size. A keratome incision was made and a peripheral iridectomy done, and the foreign body was very promptly attached to the magnet point.

Two-thirds of a c.c. of cyanid of mercury solution was injected subconjunctivally below. Two days after the operation the eye was quiet, but it is too early to prognosticate the vision.

The interesting points in this case are: (1) the tolerance of an eye for a foreign body for 5 years before any inroads are made on the vision, and (2) the ease with which the foreign body was removed after its long sojourn in the eye.

Discussion. Dr. Hilliard Wood said that he had often removed steel from the eye without iridectomy, and without any incarceration. With the giant magnet he first draws the foreign body into the anterior chamber, then with keratome makes a corneal incision, gaps the wound slightly with spatula, and with the magnet at that point the foreign body is drawn out. He called attention to the fact that if a steel spatula is used, embarrassment is likely to ensue, as the spatula cannot be held in. He uses one of aluminum, which has been found satisfactory.

Dr. M. M. Cullom had also used the above technic, with success.

Hilliard Wood,
Editor.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY.

June, 1923.

Optic Atrophy.

Dr. E. C. Ellett presented W. W., a negro man, aged 48, seen on July 13th. Vision, O. D., 20/200, O. S., P. L. Vision failing 18 months. Eight months ago he had seen halos around lights. He had been treated, apparently for optic atrophy. The pupils were dilated and very sluggish. Nerves white and cupped, the left more than the right, the right not being cupped all around. Tension with mercury tonometer, R. 32. L. 30. Corneoscleral trephine both eyes July 16th. In both eyes a complete iridectomy was done. In the left eye the scleral button was cut out clean and disappeared. It can now be seen in the upper end of the coloboma, and does not seem to be causing any trouble. The left iris touches the cornea in several places where there was no corneal wound, and seems to adhere to the cornea.

Nonmagnetic Foreign Body.

Dr. Ellett showed a water color drawing of the eyeground of a patient with a probable nonmagnetic metallic

foreign body imbedded in the optic disc. The patient was seen during the war, in Base Hospital 115, and had lost the other eye. Vision was normal in the remaining eye. It brought up very forcibly the question of what to do in such a case. The giant magnet had no effect. The lens, iris, and ciliary body were not injured, and there were therefore no symptoms. It was decided to wait. The man had been heard of once since his discharge, when he was seen by Dr. Nelson Black of Milwaukee, and the condition was unchanged. There were a great many eyes seen during the war with non-magnetic foreign bodies in them, and if they could be followed up some valuable lessons applicable to civil practice could be drawn from them, concerning the care of eyes with shot, glass, etc., in the ball.

Retinitis Proliferans.

DR. M. B. SELIGSTEIN, presented S. F., colored, age 35, occupation, oiler, was seen at the out patient department of the University July 15th, 1922. His chief complaint was that he was struck in the left eye with a fist one year previously and that his vision has been getting worse. He says his right eye has been bad for the past eight or nine years. He also states that a floating shadow seems to pass over the right eye at times.

Vision, right eye, fingers at eight feet.

Vision, left eye, 20/200.

External examination of right eye, normal except for dilated pupil.

External examination of left eye, normal.

Fundus. Right eye, vitreous opacities numerous; covering the disc is an indistinct mass, and extending from this mass downward and upward and in all directions are whitish streaks. In the extreme lower periphery of the fundus, several of these whitish streaks terminate in a pear shape patch of pigment.

Left eye shows an exudation on the temporal side of macula similar to right eye. In the lower periphery of the field there is a detachment of the retina.

With correction, the left eye is improved to 15/70.

The right eye is unimproved.

D. H. ANTHONY,
Secretary.

SOCIÉTÉ D'OPHTALMOLOGIE DE PARIS.

December 16, 1922.

DR. POLACK, President.

Pulsating Exophthalmos, Paralysis of Opposite Sixth Nerve.

DRS. POULARD and BOUSSI reported a case of a boy of 7 thrown against a wall by an automobile seven weeks before. He was unconscious for an hour and the eye greatly swollen for two weeks. There was still some swelling of the eye with ectropion of the lower lid and great protrusion of the globe. Auscultation over the temple gave a continuous bruit with systolic reinforcement. The cornea was ulcerated. Suture of the lids to save it was done with difficulty. At the end of three years, the exophthalmos was diminished, and the patient came for keratitis of the left, the previously sound eye. The right eye presented swelling of the upper lid and enlargement of the veins. The movements of this eye were normal, but there was convergent strabismus due to paralysis of the external rectus of the left eye. The tension of the eyes was R. 18 mm., L. 20 mm. Impaired hearing on both sides had been noticed from the time of the accident, due to perforations and cicatricial contraction of the drum membranes.

Discussion. DR. BAILLIART had observed local hypotension in the arteries in cases of aneurysm. The diminished intraocular tension indicated importance of the relations between the two cavernous sinuses.

DR. MORAX had observed in a case of traumatic arteriovenous aneurysm and pulsating exophthalmos a manifest hypertension of the eye. It seemed worth while to test the intraocular tension in all such cases.

Papilledema Cured by Removal of Tubercle of Cerebellum.

DRS. A. POULARD and P. VEIL presented a boy aged nine and one-half

years who had suffered from headache, occipital, crises of pain and nausea for about twenty months. Six months ago the optic papillae were found swollen, indefinite, with enlarged veins but without hemorrhages. Vision one-half in each eye and visual fields about normal. Trephining in the occipital region showed a tuberculous tumor the size of a small walnut, which was removed. Headache and vomiting quickly disappeared. The papilledema diminished and vision rose to 2/3.

Bilateral Iritis.

Dr. P. Veil presented a boy of 12 suffering from double iritis of obscure origin, which had continued for three months, impairing vision but without pain. A course of neosalvarsan had produced no improvement. Inoculation of guinea pigs with the aqueous humor was being tried.

Magnet Extraction of Foreign Bodies.

Dr. Chappe reported three cases with unusually successful results. One was found three months after the accident to have normal vision but beginning siderosis. The X-ray showed two minute particles present on the posterior surface of the iris. They were drawn forward with the giant magnet and removed from the periphery of the anterior chamber. Four months later the pupil was almost normal, and the iris practically the same color as that of the other eye.

The second patient, a boy of 15, presented with a small scleral wound, 1 mm. from the limbus. There was a little opacity in the posterior part of the crystalline lens. The acuity of vision was normal. Next day the vision was 0.9, the scleral wound was enlarged with a Graefe knife, the foreign body extracted with a giant magnet, and a conjunctival flap drawn over the wound. There was little reaction and two years later vision was still 10/10.

The third patient, a man of 22, presented on the day of the accident with a small wound in the center of the cornea and some opacity of the crystalline lens. The electromagnet produced a reaction. The magnet would not draw the particle into the anterior chamber, and a small iridectomy was done. Then the particle was removed adherent to the posterior tissue of the iris. Recovery was uneventful. The opacity remained stationary. One month later, vision was 3/10 without a glass and 6/10 with a correcting lens.

Visual Impairment in Quinin Poisoning.

Drs. J. Bollack and H. Lagrange reported the case of a man of 47, who had lived in the Congo and suffered from malaria for ten years, for which he had taken quinin, using 1.5 grams as an average dose. The day before he had taken one dose of 3 grams. An hour later headache, vomiting and disturbance of hearing and sight occurred, and nine hours after that he was entirely blind. At 15 hours he could not tell night from day, the pupils were equal, much dilated, but not to the maximum. There was no reaction to light, direct or consensual, but a slight contraction with convergence. The optic disc and choroid were normal, but the retina in the macula seemed slightly grey in contrast with the fovea. Perception of light was only present at the macula. Next day central vision had been recovered, but the fields were lost beyond 5 degrees from the fixation point. In three weeks the optic discs had become white, the retinal vessels contracted. Ultimately the pupils presented the Argyll Robertson phenomena.

Ode to Daviel.

Dr. Terrien read an ode to Daviel which had been published in a French magazine in 1752, celebrating his operative triumph over cataract.

Vision of Automobile Drivers.

Dr. Petit reviewed the different reports and standards that had been recommended in the last fifteen years. He holds that the field of vision and of ocular movement should not be materially reduced. He would allow the use of correcting lenses, since the chief objections to them apply equally to the glass of the automobile. Vision in both eyes should be useful, because one might be disabled by a foreign body. The dangers of night blindness and color sense should also be considered. He notes a case of damages awarded against a driver who had in one eye myopia of 20 D. and V. equal 1/100.

SPECIAL REPORT.

OPHTHALMOLOGIC COLLECTIONS FROM THE AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY AT THE ARMY MEDICAL MUSEUM.

JAMES F. COUPAL, M.D., Major, Medical Corps, U.S.A.

The Curator, Army Medical Museum, reports on the material thus far brought together in the Army Medical Museum by the activities of the Academy Committee and members. The James Moores Ball collection is referred to; and the pathologic specimens that have been accumulated and the manner of dealing with them.

Shortly after the International Congress of Ophthalmology, held in Washington, D. C., May, 1922, arrangements were made with the American Academy of Ophthalmology by Major George R. Callender, then curator, to accept pathologic ophthalmic material at the Army Medical Museum. This plan has yielded considerable in the way of results, the most important of which was the donation by Dr. James Moores Ball of his ophthalmic museum to the Army Medical Museum on July 4th, 1922. This material is divided under the following main items: 1. Pictorial items. 2. Gross dissections and gross pathology. 3. Microscopic items. 4. Ophthalmic armamentarium. 5. Rare ophthalmic literature.

The *historical* collection alone of this exhibit would have been a generous donation to the Army Medical Museum. It contains old cuts and biographic sketches of most of the pioneers in ophthalmology. Many of these are valuable references for the historical portion of any article on ophthalmology. This historical group consists of 136 accessions, many of which should be listed as true incunabula. Under Section 2 of gross dissections and pathology are 468 accessions. These form a complete set from the standpoint of a museum exhibit. The gross specimens of this set have been remounted, so that their mounts conform with those already provided for the ophthalmic material from the American Academy of Ophthalmology.

The *pictorial* items consist of 2 medals and 2 diplomas; 46 pictures of ocular anatomy; 180 original drawings in color, mostly pathologic; 92 microphotographs and microscopic drawings, etc.; 94 unusual colored drawings of the normal and diseased fundus; 40 colored pictures from the "Atlas of Rare Ophthalmoscopic Conditions;" 38 plates from Pagenstecher and Genth's "Atlas of the Pathologic Anatomy of the Eyeball," and 43 illustrations on operative surgery of the eye.

MUSEUM SPECIMENS.

The other valuable result of this relation has been the accumulation of pathologic material, sent in by members of the American Academy of Ophthalmology, which now numbers approximately 150 gross and over a thousand histologic specimens. This material is still coming in rapidly and contains specimens of unusual interest. Sixty gross specimens, 50 histologic specimens and 80 pictures from this collection were displayed at the Boston City Hospital, at the 16th Annual Meeting of the International Association of Medical Museums; as an example of the museum technic in handling ophthalmic material. The eyes are received in formalin, usually travel in an ordinary mailing case without any damage, are sectioned with a long, thin blade thru the equatorial plane, leaving the greater half of the optic nerve for that portion which is sectioned histologically.

The exceptions to this procedure are governed by special lesions, chiefly those new growths which are isolated and local, and for which a special plane of section is needed to show the gross pathology. The half of the eye containing the smaller portion of the optic nerve is then sewed to a small piece of vulcanite in which has been cut a hole to fit the specimen. This is then photographed, mounted in Kaiserling III and labelled. The photographs are taken with a 75 mm. lens attached to an ordinary photomicrographic camera

by means of a prism mounted in a cone. The eyes are placed under water, covered by a glass plate and illuminated by a small arc light at about an angle of 45 degrees. This type of illumination necessitates that the lens be placed horizontally and that it be attached to the camera with the prism arrangement mentioned. This method gives a magnification of about seven times, so that the ordinary eye fills an 8x10 negative. The only difficulty about this process consists in avoiding the small bubbles which float up from the deeper portions of the eye and present highly refractile circles in the picture if they are not removed.

The remaining half of the eye is imbedded in cellodin, and sections made of the globe and serial sections of the optic nerve in a plane perpendicular to that of the globe, where there is necessity to show metastasis along this structure. Rapid paraffin sections are made upon request of the contributor if there is a clinical need for early diagnosis. These early diagnoses are furnished by the staff at the Army Medical Museum, and consultation upon them is obtained from the group of ophthalmic pathologists assigned for this purpose. The emergency diagnoses can be furnished in a few days from paraffin sections, tho the celloidin imbedding is a slow process and several weeks are necessary before reports on these are obtainable.

The following men have afforded us excellent consulting services in these diagnoses: Dr. F. H. Verhoeff, Massachusetts Eye and Ear Infirmary, Boston, Massachusetts; Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois; Dr. M. Feingold, 4206 St. Charles Ave., New Orleans, La.; Dr. William C. Finnoff, 318 Fourteenth St., Denver, Colorado; Dr. W. E. Camp, Minneapolis, Minnesota, and Dr. H. Barkan, 516 Sutter St., San Francisco, California.

Microphotographs can be prepared of any of this material for use in illustrating articles or in teaching of ophthalmology. The sections themselves can also be mounted, and with the routine hematoxylin and eosin stain make a very acceptable lantern slide. Lantern slides for teaching can also be prepared from the gross photographs, and since these are magnified several times, are rather excellent in their detail.

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INTERNATIONAL OPHTHALMOLOGY.

The Société d'Ophtalmologie de Paris, the Société Française d'Ophtalmologie and the Société Belge d'Ophtalmologie have united in stating that they are willing to have German declared one of the official languages at the London Ophthalmologic Congress, since it is a scientific language well known to many people, and that they are willing to have Austria, Hungary, Bulgaria and Turkey invited to attend, but that they will refuse to attend if the Germans are invited. They state they are acting in accordance with a resolution adopted in London, October, 1918, upon the initiative of the Royal Society, later approved by the International Council of Research, Brussels, July, 1922. They further state that the Association of German Physicians has recently decided to refuse all medical aid to French or Belgians.

The above, taken from the Gazette des Hôpitaux, 1923, v. 96, p. 993, is a sad commentary upon the civilization of the twentieth century, and an equal indictment of both sides of the controversy. One side graciously separates the language from the people speaking it; the other refuses to extend aid to sufferers of other nations—assuming that this statement is correct. Some of our colleagues across the water seem to have lost all sense of proportion, for so long as the Germans write and the French and Belgians read, the former are giving aid to their enemies and the latter are mingling with them in mental companionship. We cannot believe that all of them join in this selfcondemnation. We believe that in this case, as usually, the clamor of a few is being taken for the will of the many, and that the good judgment of both sides repudiates—if silently—these actions. Sooner or later, this silent force—if it exists—will make itself felt, and the chauvinistic fury will pass away. If it does not exist, it is time for the World to say in the words of the Prince in Romeo and Juliet—"A plague on both your houses."

C. L.

SUDDEN BLINDNESS.

Instantaneous loss of sight is rare. Any history of it raises the question, is it correct? When the impairment of vision is very gradual, the discovery of the fact is always sudden, whether this discovery is made early, when the

loss is still slight, or whether the change is not discovered until useful vision is gone. Hence in most cases of cataract and simple glaucoma, the history of the trouble does not go back to the beginning, and many patients believe their disability came on suddenly. Hysteria is generally characterized by departure from the rules of organic disease, and so is the sudden onset of hysteric blindness. Malingerers, too, claim sudden loss of sight.

When the blindness is really instantaneous, it is generally due to a vascular lesion, arterial spasm, embolism, or thrombosis with spasm superadded. This is the case whether it is loss of the vision of one eye, lesion of the central retinal artery, or part of the field of one eye, as lesion of a retinal arterial branch; or loss of a part of the field of both eyes, homonymous hemianopsia or sector defect, from lesions of vessels supplying the optic tracts or centers. Loss of vision thru hemorrhage or venous thrombosis may also be sudden, whether these occur in the eye or within the cranium; but it is not so sudden as that due to blocking of an artery by embolus, or spasm.

Toxic amblyopia may be sudden, but it is not instantaneous. It may come on in a few hours; and may be found complete on awakening, and so may appear entirely sudden. The same is true of retrobulbar neuritis due to focal infection or other causes. The patient finds himself blind on awakening from a wood alcohol debauch, or after an excessive dose of quinin. But if conscious during the time of onset, he notices a clouding of vision that increases, rapidly perhaps, but still gradually. Even tobacco amblyopia is liable to sudden variations in its severity, and one of these exacerbations may give rise to the history of sudden onset.

Ophthalmic migraine, scintillating scotoma, or "dazzles" sometimes cause practical blindness in a few minutes; altho in most cases only part of the visual field is involved. When the patient has become accustomed to such seizures, he may accept them as unpleasant incidents with complaint or resignation. But a first attack may be as alarming as an attack of embolism. For a few minutes he does not know but that the disability is permanent. The blindness that comes with a fainting spell also may be the most alarming feature. Both of these are instances of disturbed circulation, and the same explanation applies to the sudden spells of blindness that may be encountered with brain tumor, or disease of the hypophysis.

The sudden consciousness of a defect of the visual field that may be noticed in detachment of the retina, is more likely to be due to a shifting of the subretinal fluid than to any sudden increase in its amount. Recovery of the field is always a more gradual process, depending on restoration of the retinal nutrition. Intraocular hemorrhage, if its progress is watched, may rapidly shut off the sight, but does not interrupt it instantly. Instant blindness from trauma, if it does not depend on complete destruction of the globe, is more likely to be due to injury of the optic nerve than of the eyeball.

Sudden blindness is so exceptional and so alarming, it arises from such a wide variety of causes, it may be met as such an imperative emergency, that the practitioner of ophthalmology should occasionally review in his mind this list of its possible causes, in preparation for the demand for advice in regard to it, that is sure to confront him some time, calling for action without time for much thought or study about it.

E. J.

GRADUATE STUDY OF OPHTHALMOLOGY.

Two years ago there was carried thru at Philadelphia, the birthplace of Medical Teaching in America, a three days' course of graduate study such as had not been attempted before, anywhere in the world. It was arranged by a committee of the American Academy of Ophthalmology and Oto-Laryngology.

The teachers and five hundred students were drawn mostly from the membership of the Academy. When the

Academy met last year in Minneapolis, the achievement was emphasized by repetition, with different teachers and a different list of subjects; but with the same enthusiasm on the part of the speakers and the same interest on the part of the listeners. This month at Washington the third course of the kind will be given; and so far as can be judged, at the present time, with even greater enthusiasm and interest.

Some years before this, the Clinical Congress of Surgeons had revealed an eagerness for instruction on the part of American surgeons, an homage to the very name of graduate study, that was a revelation to most teachers of medicine. Thousands flocked eagerly to the city where such a congress was held, to crowd its hotels; to sit and stand in clinic rooms where operations were going on, that they could not see; and to listen to the evening addresses for such new thoughts regarding surgery as great teachers had to offer. These congresses are being imitated on a smaller scale, but with quite as much real educational value, in various cities and in connection with different medical organizations.

These great responses of the medical profession to new opportunities for graduate study have been most interesting and inspiring. A somewhat different one of equal significance has just been witnessed in Colorado. The course of lectures delivered last year by Professor Fuchs, at various points in the United States, awakened in his class at Houston, Texas, an enthusiasm that expressed itself in the formation of a society that resolved to repeat such courses every year, and planned to have one in New Orleans in January. This course was postponed, but, with some modifications, the plan was carried out in Denver in July, under the management of a committee of the Colorado Ophthalmological and Oto-Laryngological Societies.

The class numbered forty-three, of whom thirty-five came especially for the two weeks' course, while eight were from the regular summer class in ophthalmology of the University of Colorado. The instructors were drawn from New York, Albany, Baltimore, New Orleans, Los Angeles, Chicago, St. Louis, Iowa City and Omaha, beside those living in Colorado. From 8 o'clock to 10 each morning, the time was devoted to clinics and demonstrations, the class being divided into sections of six each. From 10 to 12 and 2 to 4, lectures, chalk talks and lantern demonstrations were given to the whole class. The course was carried thru easily and successfully, developing keen interest and warm enthusiasm on the part of the students and teachers. Before it ended, the resolution was adopted, that a similar course should be given there next year, and from year to year thereafter, and with the expressed hope that such courses should be established elsewhere.

When Professor Fuchs was in America, he witnessed and took part in the Philadelphia course of the Academy. He learned of the ten months' course just started at the University of Pennsylvania. Later it was suggested to him that a systematic course in ophthalmology, given in Vienna, would render more available the great clinical advantages of that teaching center and would exert a good influence on such teaching thruout the world. He took up the subject by letter with Professor Dimmer and Professor Meller of the Vienna clinics; and such a course was given in October and November of last year to a class limited to fifteen. It is now being repeated, with the addition of the lectures by Professor Fuchs, which can also be taken by those who are not fortunate enough to get into the class of 15 for the complete course. Professor Vogt has given a special course on red free light and announces a repetition of it; and other European teachers, including Lagrange and Barraquer are seeking to follow the path marked out by Professor Fuchs.

The graduate study of ophthalmology begins to attract the attention it deserves. Attention was called recently (A. J. O. v. 6, p. 615) to the graduate course given at Peking Union Medical College during Professor Fuchs' visit. The Robert Henry Elliott

School of Ophthalmology in Madras, India, teaches over 30 students each year. The twenty ophthalmic hospitals of Egypt have been training schools of ophthalmology, until now their immense service is all in the immediate charge of Egyptian ophthalmologists. In Japan, Komoto and a few others established hospitals and trained their assistants until the Society of Japanese Ophthalmologists contributes much of value to the world's ophthalmic literature. In the September number (p. 775) is given some idea of how much is being done to afford opportunities for graduate study in ophthalmology in South America.

The one hundred millions of people in the United States desire and will pay for more and better ophthalmic service, than any other equal population on the face of the earth. It is evident from the instances cited at the beginning of this article, that those physicians who, without systematic training for it, have been trying to meet this need, appreciate the importance of graduate study in ophthalmology. It is equally clear that there are in America some who are already competent teachers in this branch, and many others who need but opportunity and practice to become competent teachers. Meanwhile great universities, with the clinics and equipment necessary for such teaching, turn out two or three well trained men a year, while six-weeks schools of optometry send out hundreds, each equipped merely with a trial case, a stock of spectacle frames and unlimited self assurance.

It is time for the ophthalmologists of America, many of whom are keenly alive to the deficiencies in their own preparation for ophthalmic practice, to take into their own hands the supplying of this need of the profession and the public. Organizations like the American Academy of Ophthalmology and Oto-Laryngology can very quickly provide for lectures and demonstrations. When those engaged in ophthalmic practice have gotten together and formulated their needs, they must break into the laboratories of physics and pathology of the higher institutions of learning, and see that their facilities are brought into this large public service.

If the ambition to teach ophthalmology could only be made to replace the ambition to write long papers, or to devise new instruments and operations, ophthalmic literature would be better, our armamentarium would be less confused, operations would cease to be fads or fashions of a season; and adequate systematic training would prepare enough men for a profitable professional life in giving real public service, to displace the schemers interested chiefly in smart advertising and the psychologic trickery of the quack. Let us work out methods of study and teaching, discover and train those who are able and anxious to teach, and set about getting the service of whatever laboratories and clinics are needed for this high grade of training for ophthalmic practice.

E. J.

BOOK NOTICES.

Treatise on Ophthalmology. Traité D'Ophtalmologie by **A. Poulard**. Masson et Cie, Libraires De l'Academie de Médecine, 120 Paris, 1923. (2 volumes.)

The French treatises since the war are of the highest class, and not only take the place of those formerly evolved by the Germans, but in contents are more like those of American and English thought, as the student and practitioner can quickly find the subject in which for the moment they may be specially interested. This author has eliminated historic descriptions of no particular interest, all controversial subjects, and abandoned medications and those operations which have proved to be without much value, or are impractical. The beautiful printing and absolutely new illustrations are specially noteworthy. The author places great importance on pictures that give a description at a glance, which would otherwise take many words and are at times difficult of comprehension. Documentary photographs of actual cases and procedures

and line drawings of distinct value fully illustrate the work, of which there are four hundred and two figures and three colored plates in the first volume. In the two together there are seven hundred and ten illustrations.

He does not dwell upon the details or pathologic anatomy as thoroly as in special books on the subject, but those lines of clinical interest are described together with the surgical procedures. A brief summary of the chapters shows that the work is written in a complete and novel manner. The conjunctivitides are grouped in a fashion to permit of easy clinical diagnosis. The syphilitic lesions of the conjunctiva are thoroly treated. Traumatism of the globe and orbit have been brought together in one chapter. The conservative operations for wounds of the eyes are precisely and fully described. A special study is made of that redoubtable complication of ocular wounds—sympathetic ophthalmitis. Photographs show practical restoration of the lids for the treatment of cicatricial deformities. This closes the first volume of seven hundred fifty-three pages.

In volume two, in the chapter on refraction, a clear and distinct description of the determination and correction of ametropia is given. The various modes for the extraction of cataract are described. The author chooses those methods which have been perfected in recent years and describes his own procedures. The difficult question of the surgical treatment of strabismus is detailed in a profound manner and many illustrations are given. It is the same with paralytic ptosis. Diseases of the fundus, the vitreous, choroid and retina are studied in connection with general diseases. In the chapter on glaucoma the author describes the surgical methods and treatment. Finally, the diseases of the nervous system connected with the eye are given an important place. The numerous and good illustrations and the fine work of the printer act as a proper frame for the scientific picture so conscientiously painted in words by the author. H. V. W.

Textbook of Ophthalmology. Prof. Paul Roemer, Director of the Eye Clinic in the University of Bonn. Fourth revised edition. 500 pages with 306 illustrations in the text, and 32 colored plates. Urban and Schwarzenberg. Berlin and Vienna, 1923.

In our review of the fourth edition of Roemer's well known textbook, we here set forth its recommendable features; which have been preserved and adapted to the progress of ophthalmology in the new edition, without increasing its volume. It excels in clear disposition and very easily readable style. The description of the clinical aspects is greatly helped by the still greater abundance of photographs and well executed colored pictures, also of normal and pathologic histology, and ophthalmoscopic plates. The single chapters are preceded by brief presentations of normal anatomy and histology. One section is devoted to neurology of the eye, including the eye symptoms in a series of diseases of the brain and spinal cord, and the anatomy of the visual paths. Under anomalies of refraction, a paragraph on the usefulness of telescopic spectacles for far and near vision is inserted, with illustrations. The chapter on simulation, with new methods of its exposure, is also very serviceable. Thus the new edition of this valuable work can be highly recommended. C. Z.

Ophthalmic Surgery. Dr. **Joseph Meller,** Clinical Professor of Ophthalmology Eye Clinic I, University of Vienna. Edited by Dr. Wm. M. Sweet, Clinical Professor of Ophthalmology, Jefferson Medical College, Philadelphia. Third edition. Cloth, 8vo, 382 pages, 219 original illustrations. Philadelphia. P. Blakiston's Son and Co.

This is translated from the second edition of Meller's "Augenärtzliche Eingriffe," noticed in this Journal July 1921, (vol. 4, p. 550). It is a complete translation of that work, with the beautiful illustrations reproduced; so that the comments made upon it in the original will stand for the translation.

It differs from the German edition, however, in two particulars. That was dedicated to Professor Fuchs and contains his reproduced photographic portrait, one of the best extant. This is dedicated to the Rockefeller Foundation "With the feelings of the deepest gratitude for the magnificent and noble support which, in the years of distress, it granted the medical faculties of the Austrian Universities."

Instead of the Fuchs' portrait, this edition contains a preface which sets forth, in five pages, Professor Meller's views on the teaching and study of ophthalmic surgery. He says: "Teaching has more influence on the development of the pupil than many of the general qualities which were at one time supposed to form the foundation. Operating is an art, just as any other, for the acquisition of which systematic instruction is the chief condition. That which the individual can only find out laboriously by himself, what he only attains after many failures, is often made clear by a word from the master, and with this help all difficulties suddenly disappear. Even one who is exceptionally talented for any art cannot attain the highest degree of proficiency and become master of that art if the teacher is wanting. As a condition for becoming proficient in ophthalmic surgery, a thoro general preparatory training in the whole science of ophthalmology is requisite, in the diagnosis of the diseases of the eye as in the treatment of the patient. Operating must, therefore, form the keystone of ophthalmic study and is an essential part of the instruction of the student. The beginner in ophthalmology, on the contrary, is filled with the desire to be allowed to operate as soon as possible; but such beginnings can only be attended with failure, if the operator is not intimately acquainted with all phases of disease of the eye."

After pointing out the way that a general education in ophthalmology contributes to making a good ophthalmic surgeon, Meller states two ways in which instruction is helpful. "The first is the correct demonstration of the proper method of operation, accompanied by corresponding explanation. The second, equally important part of the instruction, is the analysis of the mistakes."

Every bit of this preface will be found helpful in the highest degree, by every student who will carefully read and consider it. We may emphasize the fact, that this is not an encyclopedia of operative methods; but a handbook to help the student acquire a mastery of the best methods and technic, as these have been developed by a great teacher in one of the greatest teaching clinics of ophthalmology in the world. In the translation and reproduction of the work there is nothing for adverse criticism. Author and translator both deserve the thanks of English speaking ophthalmologists.

E. J.

The Ophthalmic Year Book. Vol. XIX.. Edited by Edward Jackson and William H. Crisp, with the assistance of 29 collaborators. Cloth bound, octavo, 398 pages. Chicago, The Ophthalmic Publishing Co.

The form of a single cloth bound annual volume has been resumed, for this review of the literature of ophthalmology. In general appearance this volume is much like the early volumes of the series, before the magazine form was assumed, in the merger with other publications that gave rise to the present AMERICAN JOURNAL OF OPHTHALMOLOGY. The larger double column page of the magazine, however has been retainetl for the digest of the literature. The thinner paper adopted will keep the series of volumes from filling library shelves so rapidly, as a thicker paper was doing.

It is interesting to compare this volume with the first volume of the Ophthalmic Year Book, issued nineteen years ago. The increase in thickness is forty percent, in the number of pages fifty percent, but in the quantity of the digest it is one hundred and ten percent. Even as compared with the last volume issued in this form, seven years ago, there is an increase of twenty-seven percent; altho for some subjects volume XIX does not contain the review of the literature for the whole year. In changing from quarterly

to annual publication, the average period here covered is about eight months. However, the section on Comparative Ophthalmology, by Dr. Casey Wood, covers the literature of six years, that time having elapsed since such a review was last published. Other sections also notice articles published during the war period, when the distribution of journals was greatly interfered with, so that the articles in question have only recently been available for abstract.

In one respect Volume XIX falls behind Volume I; it is in the matter of illustrations. In Volume I there was a colored plate and forty-five figures in the text. In Volume XIX there are but three illustrations. What is still regarded by some as the ideal year book—Nagel's Jahresbericht—did not attempt to give illustrations; neither does its present German successor, Die Zentralblatt für die gesamte Ophthalmologie und ihre Grenzgebiete, and its supplement, the Jahresbericht über die gesamte Ophthalmologie. The French Revue Générale d'Ophtalmologie also avoided this undertaking. The Ophthalmic Year Book made the first attempt to do this among such reviews of ophthalmic literature.

There are especial difficulties about the reproduction of illustrations in a work of this kind, prepared by a large number of collaborators. The illustrations published in the original articles are in a sense rendered available thru the bibliographies of the Year Book; and very many of them are already in the possession of subscribers to this journal. But we think they do add greatly to the value of such a concentration of the world literature, especially the diagrams that explain operations or anatomic relations, and the representations of new instruments and interesting cases, that have been published in other languages and are not accessible to the mass of readers. We trust that ways will be found to secure an adequate series of illustrations for future volumes.

The difficulties attending a change of printers delayed the appearance of this volume about six weeks beyond the time it was expected to appear. But its eight months in preparation and publication compares favorably with the longer periods required to get out other year books. We know of no other that has been issued in completed form so promptly.

It is unusual for one of the editors to review a book. But in this case, the various chapters are the work of collaborators and the actual editing has almost wholly fallen upon his colleague. Then there is the possibility that an editor who has worked twenty years on a certain publication may know some things about it, that should count in a notice of it, but are not appreciated by most writers of book notices. It should be noted also that this journal publishes book reviews from various writers, sometimes two or three referring to a single book. Any reader who wishes to discuss this volume from his own point of view will be given an opportunity; either in this department or under correspondence, as seems most appropriate.

E. J.

Pasteur. National Celebration of the Centenary of the Birth of Louis Pasteur at Philadelphia, December 27, 1922. Quarto, flexible paper, 70 pages and 19 plates.

This is a memorial volume. The celebration it commemorates was arranged by a committee, of whom all but one were members of the medical profession. The secretary and active worker was Dr. McCluney Radcliffe, of Wills Eye Hospital. We surmise, too, he has edited the volume which reflects credit on all who have contributed to its production. Three other oculists were included in the National Honorary Advisory Committee.

Pasteur's contributions to medical and surgical science were basic, and have influenced every special branch. Of the eleven who delivered the addresses that occupy most of this volume, seven are physicians or surgeons. The others were a chemist, a biologist, the French Ambassador and the President of the Carnegie Foundation. Messages were sent by a half-dozen other dignitaries, including the French Doctor Roux, Director of the Pasteur Institute of Paris and Dr. Pasteur Vallery Radot, Pasteur's biographer.

This volume gives honor to the dead and inspiration to the living. The great scientist, who carried the experimental method over from physics and chemistry into biology and pathology, gave to mankind bacteriology, antisepsis, immunology and their myriad industrial, medical and sanitary applications. His life and work may well be thought upon by all who study the normal and abnormal processes of life.

E. J.

Simon of Cyrene Dimachaerus Splendens; the Story of a Man's (and a Nation's) Soul. **Thomas Hall Shastid**, M. D., Sc. D. Large octavo, 446 pages. George Wahr, Ann Arbor, Michigan, 1923.

Read as a novel, as an allegory, or as an historic romance, this book grips one's attention from the first chapter to the last word. It is indeed the story of a Nation's soul. As a novel, the story is intensely interesting, taking one thru the life time of the man that bore the cross for the Savior from Gethsemane to Golgotha. It captivates the attention in the beginning, grows in depth and power with each successive chapter and caps the climax with wonder. It carries the reader thru a series of events surpassing indeed the adventures of Ben Hur, so beautifully described by General Lew Wallace.

As an allegory, read you again the book of Revelation. Read again the Pilgrim's Progress of Bunyan, and read in this book the most wonderful description of the Soul of the Jew, for this is indeed a word painting of the mental and religious evolution of the Jew from ancient and medieval times to what are now his conceptions and leanings. Even he, as did Simon, has not yet accepted the Messiah. Even he, the modern Jew, may indeed not accept Him and be not enfolded to His bosom until after death. As an historic romance the author has skilfully passed over details, but in general the historic events of Jewish history are touched upon. The great phases of Jewish soul life are symbolized, especially the reaction of the Jewish nature to idolatry in the Egyptian events. In the Peteran, Nabathaen, Palestine, Syrian and Babylonian portions, this is clearly and wonderfully represented.

Parts of the story are sad beyond belief; some are even sordid and repellant and others have a touch of humor. But as a story it seems to be true to the chronicles of the Talmud, to the Bible, and to the prophesies of the soothsayers. The Jews, despite their occasional relapses into idolatry, never gave up the conception of the true God. The Jew as a race is the one that has ever been true to this ideal. However, by whatever name he may have called his God, this we know was never His real name, the Ineffable Name which is never written and only whispered, and which has been brought down to us thru the traditions of Masonry.

The Jewish traits of character in the concept brought out by Dr. Shastid are wonderfully displayed. The principal figure is not a hero. He is the almost human character upon which the raiment of fact and fancy has been placed to fix the attention of the reader. What a wonderful pageant this story would make!—perhaps as great as that of the Passion Play of Oberammergau, of the Wayfarer by Crowther, or of the new pageant shortly to be produced, of Americanus by Professor Edmund Meany. What a wonderful cinema could be made, the interest surpassing that of the million dollar pictures now being displayed. The more we brood upon it, we see that each character, as well as each incident is not only a finished story but has a fine allegorical meaning. Read the book as a whole. It is indeed soul absorbing. Dip into the pages here and there and it is indescribably interesting. I say read it for the interest of the story. Read it for its wonderful word painting. Read it for its historic value and read it again for its profound truths.

It is indeed interesting to the medical profession, especially the ophthalmologists of America, and they are to be congratulated and may feel happy in welcoming this work of our friend

and colleague to our reading tables. Every one should buy the book.

H. V. W.

The test of a book is the reaction of the reader. The above is such a reaction, and it will be understood by those who read the book. Written by an ophthalmologist and inscribed to an ophthalmologist, it will be read by ophthalmologists and thru them make its appeal to some part of the wide circle of readers that awaits such literature.

This is a picture of the world of the first century under Roman rule, seen from the viewpoint of the twentieth century—a story told in primitive English. In this age of camera and screen, it shows that the word picture still has power. The book is full of action and dialogue as a good play. The world picture brings to us the atmosphere of the classics, the soul story is a real one, tho told of the Jew by an orthodox Christian.

We keep growing mentally by ideas and thoughts brought in from without, or in response to unusual stimuli. This book brings the ideas and the stimulus that come from beyond the boundaries of professional routine and daily contact. It is worth knowing, altho we found nothing of ophthalmology in it, except reference to classic literature as authority for a statement.

E. J.

ABSTRACTS

Terrien, F. Ocular Conditions Observed with Affections of the Respiratory Apparatus. Paris Médical, 1923, vol. 13, pp. 81-82.

Terrien divides the ocular phenomena seen in respiratory affections into those of reflex, mechanical, and infectious origin. Under the phenomena of reflex origin, he calls attention to the normal dilatation and contraction of the pupil occurring respectively during inspiration and expiration. He notes that in dyspnea, the pupils are dilated due to irritation of the pupillary center in the medulla by deoxygenated blood, while in Cheyne-Stokes respiration, during the period of apnea, they are contracted and do not respond to light because of temporary paralysis of the sympathetic.

Under mechanical lesions, Terrien includes emphysema of the lids or orbit following fractures of the walls of the nasal accessory sinuses, and subconjunctival and retinal hemorrhages caused by coughing. These latter are the result of venous stasis and obstruction to the return circulation. After hanging, hemorrhages into the subconjunctival tissues, lids, retina, and canal of Schlemm are found. Coughing has been followed by pulsating exophthalmos, and, in one child, by external ophthalmoplegia, facial paralysis, and hemianopsia. Similar accidents have been reported in glass blowers.

Among the lesions due to infection, Terrien mentions first corneal herpes and dendritic keratitis occurring in the course of pneumonia. Pneumonia and chronic apical lesions can also cause dilatation and later contraction of the pupil on the side of the lesion, as a result of irritation and paralysis of the sympathetic. There also occur in the course of, or as sequels of pneumonia, ocular muscle palsies, such as bilateral oculomotor paralysis and paralysis of accommodation, like that in diphtheria, without paralysis of the pupil. Metastatic ophthalmia also occurs, and, more rarely, neuroretinitis. Sarcoma of the lungs or mediastinum may metastasize to the choroid. Excessive hemoptysis may be followed by amaurosis from loss of blood.

Under the head of the influence of ocular affections on the respiratory apparatus, the author mentions that pressure on the upper lid with the finger, as well as irritation of the conjunctiva or cornea, will retard expiration. Instillations into the conjunctival sac will momentarily stop inspiration. Irritation of the cornea may relax spasm of the glottis. Exposure to sunlight or to

a bright artificial light will cause sneezing in some persons, either thru a ciliary reflex, or thru the passage into the nose of increased lacrimation from retinal irritation. Conjunctival infections like diphtheria can extend to the nose and pharynx. Malignant tumors of the globe may metastasize to the lungs. In a group of forty-six sarcomas of the uveal tract, metastases were found in the lungs three times and on the epiglottis once. H. P. Wagener.

Rochat, G. F. Quantitative Study of the Binocular Fusion of Complementary Colors. Arch. Néerlandaises de Physiologie, v. 7, p. 263.

Rochat mentions that Helmholtz did not accept a binocular fusion, which has been accepted later by v. Kries, Parinaud and others in special circumstances. Trendelenburg was the first who tried to measure it, but as he could not pass from monocular observation to binocular without changing the spectroscope, and as he had to rely on memory for the yellow and white his observations do not seem conclusive.

Rochat used the spectroscope with three slits, indicated by Donders. For the exact appreciation of the white of the mixture, it was necessary to have a white object for comparison. He comes to the conclusion that colors which are complementary for a single eye are also complementary when seen with two eyes. For both conditions the relation in which the colors must be mixed for the production of white is about the same. In general a little more of the light of short wave length is needed in binocular observation.

It is quite remarkable that the binocular fusion of complementary colors so that white originates, takes place according to about the same rules as the monocular fusion. This is surely opposed to the opinion of those who explain the fusion of colors by a chemical process in the retina itself. E. E. B.

Addario La Ferla. Posttraumatic Interstitial Keratitis, Médicolegal Aspects. Arch. di Ott. 1922, 29, p. 503.

A man of 56 was seen two days after he had received a violent contusion of the left eye by a clod of dirt, thrown up while he was working in the field. A milky infiltration occupied a large part of the cornea, seeming to affect almost its entire thickness, and suggesting at the outset an avascular form of interstitial keratitis. An area in the center of this stained with methylen blue, and altho this healed over after a few days of treatment, the pain continued to grow worse, and the cornea took on a grayish appearance with lines of infiltration in the lymphatic spaces, visible to the naked eye. Subconjunctival injections of serum, and general paraspecific therapy were of no avail, and in one month the cornea became completely white, and later extensively vascularized. The Wassermann was negative, and there was nothing in the history or other symptoms to suggest either lues or tuberculosis. A recent attack of rheumatism was reported, but cases of keratitis on a rheumatic basis are very rare. In view of these findings, a report was given to the insurance bureau of posttraumatic interstitial keratitis, in a subject predisposed to it. The other eye was at no time affected.

A young blacksmith was seen two months after being struck by a stream of powdered coal. A slight loss of epithelium was noted by his first physician in the right eye. After a few days a deep infiltration began to develop, showing as numerous greyish points in the parenchyma just over Descemet's membrane. The left eye became affected in less than a month, and both eyes went thru a typical interstitial keratitis of the classic type. In both these cases the insurance authorities refused any compensation, denying any relation between the traumatism and the disability. La Ferla believes that in both these cases the influence of the traumatism was undeniable, since in both, the eyes were previously normal, the pathologic manifestations followed immediately upon injury, and were continuous until the disease had run its course. He insists that insurance societies, in estimating the consequences of an accident, should take into account the previous condition of the claimant, and that they cannot deny, simply because the effects of an accident are

influenced materially by a luetic, tuberculous, or arthritic soil, a proper compensation to those injured in labor.

S. R. G.

Iacobellis, G. Treatment of Hypopyon Keratitis with Subconjunctival Injections of Milk. Arch. di Ottal. 1922, v. 29, p. 468.

The author reviews previous reports on parenteral injections of milk in ocular therapy, the work of 30 authors being mentioned, with bibliography. Few authors, however, have made use of the subconjunctival method of administration. Iacobellis treated 7 cases of severe corneal ulcers with hypopyon by this method. The ulcers were mostly of 10 days to two weeks' standing when first seen; and in three cases dacryocystitis was also present. Most were in peasants, the ulcer having been started by some slight traumatism to the cornea.

Aside from the milk injections, extirpation of the sac was performed in three cases, but aside from this, atropin, and ointments of formic iodid or yellow oxid comprised almost the only treatment. In most cases, the pain and photophobia were promptly relieved after the first or second injection, the hypopyon was quickly absorbed, and the congestion of the iris began to disappear. The visual results obtained were not especially good, since in most cases the ulcer was of large extent when first seen. Two cases, especially deep ulcers, went on to perforation. The length of time required for complete healing of the ulcerated surface was 9, 12, 14, 4, 17, 8, and 21 days, respectively.

One-half to 1 cc. of fresh milk, boiled for 5 minutes, was the dose usually given, the injection being made after cocainization of the conjunctiva, and moist heat being applied for half an hour afterwards. Injections were usually given every other day, until healing was complete; and even when one dose was not completely absorbed, the next injection was given if it seemed to be needed. Injections were made beneath the bulbar conjunctiva in the affected quadrant. No general reactions were produced, and no marked local reactions were noted. After the first injection, subsequent injections were usually a little painful, as local anesthesia was less successful on account of the hyperemia. The author feels that this method of treatment is one of the best means of combatting severe corneal ulcers, as it not only relieves the symptoms, but stops the progress of the ulcer, hastens healing, and shortens the duration of the affection.

S. R. G.

Monrad-Krohn, G. H. Determination of Fatigue in Neurasthenics. Norsk Magazin for Laegevidenskaben, vol. 84, p. 113.

A very simple apparatus is used to measure the minimum stimulus necessary to hold binocular vision. When a person is tired this minimum stimulus is increased. The author puts the test to a very practical application. He determines the fatigue index of a neurasthenic in the morning, and takes it again at the close of the working day. If it is increased, he concludes that the patient's work is too hard for him, and it should be diminished until there is no difference before and after work.

D. L. T.

Mazzei. Action of Adrenalin on the Muscular Membranes of the Eye. Arch. di Ott. 1922, v. 29, p. 463.

Previous work is quoted showing the effect of long continued use of adrenalin on the vascular system. The changes produced in the aorta and other vessels, a thickening of the endothelial lining, with degeneration of the intima and formation of calcareous plaques, greatly resemble the usual changes of arteriosclerosis. Tho the arterial hypertension produced by adrenalin plays a part, it is apparently not the only factor, as the same changes have been observed in the veins and lymphatics. It seems probable that the alkaloid exerts a toxic influence on the muscle fibers of the vessel walls. Valude and Duclos observed slight changes in the conjunctival vessels of rabbits, after repeated instillation of adrenalin into the conjunctival sac. Mazzei investigated the effect of repeated subcutaneous injections of

1:1000 adrenalin on the vessels of the uveal tract. In three rabbits in which daily injections were given for three to ten weeks respectively, no changes were observed; except a slight hyperemia of the choroid, in the two animals who were so treated for ten weeks. He concludes that this may be due to vascular spasm. S. R. G.

Junès, E. Treatment of Trachoma by Subconjunctival Infiltration of Mercury Cyanid. Gaz. des Hôp. 1923, v. 96, p. 237.

This method of treatment was first described by Rothmund (Munich), who used concentrated solution of sea salts for the purpose of clearing up corneal opacities. Subconjunctival injections for trachoma have been used especially by Santos Fernandez, Dransart and Cuénod. A great number of substances have been recommended, but most men prefer the cyanid of mercury. Cuénod had used this as early as 1902, with great success.

The method used by the author is a modification of that of E. L. Jones. The solution for injection is Hydrarg. cyanid. 0.01, cocain hydroch. 0.3, aquae dest. 30.0. After careful local anesthetizing, an amount is injected sufficient to infiltrate the entire upper half of the conjunctiva. In about one-half hour there is intense pain, headache, swelling of the conjunctiva and lids, and lacrimation. The side of the face may become swollen. To relieve this, the patient should remain in a dark room and make continual applications of either very hot or very cold compresses. It may be necessary to administer an analgesic. The pain lasts about six hours; the swelling about five days. Subsequent treatment consists in smoked glasses, antiseptic collyria and astringents, especially sulphat of copper in glycerin.

One injection is usually sufficient, but a second, third or fourth may be necessary. Untoward incidents are: (1) preoperative, unruly condition of patient; (2) operative, pain during injection, loss of injected fluid, extravasation of blood; (3) postoperative, pain, scarring of conjunctiva. The treatment is contraindicated in the acute and in the cicatricial stages, but is indicated especially in florid trachoma. The results are vastly superior to any other form of treatment, and recurrences are very rare. The treatment acts by causing adhesion of the conjunctiva to the ball, by the bactericidic and irritative action of the mercury and by the dissecting action of the fluid. C. L.

Buchanan, Leslie. Monocular Optic Neuritis. Brit. J. Ophth., v. VII. 1923, p. 170.

The author records four very interesting case histories of this character. All were in females, less than middle age, apparently in excellent health. In two, vision was reduced to gross objects and in two light perception was abolished. In the latter two it would seem that the pressure far back in the orbit was extremely high. All eventually recovered, one having a recurring attack in the fellow eye.

Due to a localized nonsuppurative inflammatory focus in the orbit, the condition probably started as an acute retrobulbar neuritis and later became intraocular. There was no paralysis of muscles or other symptoms indicative of a cerebral or sinus cause. Undue exposure to cold and inclement weather was assigned as the precipitating cause of the disturbance. D. F. H.

Villard, H. Optic Neuritis of Dental Origin. Soc. d. Sci. Méd. et Biol. 1923, Jan. 12. Gaz. d. Hôp. 1923, v. 96, p. 178.

The woman patient presented an acute retrobulbar neuritis which could be traced only to a faulty dentition of the right upper jaw, the same side as the neuritis. All of the teeth and all diseased or suspected roots were extracted, which was the only treatment. Forty-eight hours later, the vision rose from 1/50 to 0.2, and in a few days the cure was complete and permanent. C. L.

Addario La Ferla. Treatment of Trachoma by Sculco's Method. Arch di Ottal. 1922, v. 29, p. 219.

Clinically La Ferla has recognized the beneficial effect of Sculco's method.

He believes that its effect on corneal scars from pannus is due to the intense stimulation to phagocytosis by the ferments present in the drugs. This effect is also exerted on the conjunctiva, and in the stages of the disease where only hyperplasia has occurred, restoration to practically normal conditions is rapidly obtained, so that no signs of a previous trachoma may remain. In one case the author treated the right eye with Sculco's method and the left with a classical course of silver nitrat. The granulation diminished rapidly in the right eye, and secretion stopped in six days, and on the twentieth day there was nothing left of the disease except a few fine cicatricial lines. In the left eye the process was unchanged.

A strip was excised from the upper fold of each eye, so that the anatomic changes could be compared. In the left eye, treated by the ordinary method, the typical changes of trachoma were present, these being typical follicles infiltrated with leucocytes. In the right eye there was no lymphoid infiltration in the superficial subconjunctival layers. The epithelium was thickened but contained no leucocytes. There were no follicles, but only a thickening of the connective tissue elements, showing the probable site of former follicles, with occasionally very few small groups of epithelioid cells in such areas. He considers that the drugs produced a chemotropic effect on the tissue and also a parasitotropic effect on the agent of trachoma, allowing the follicles to be absorbed, or preventing their formation.

S. R. G.

Ticho, A. Ophthalmomyiasis. Brit. J. Ophth., v. VII, 1923, p. 177.

Ophthalmomyiasis is a descriptive term for a set of symptoms caused in the eye and its annexes by the larvae of diptera. They may be external or internal according to parts involved. The latter may be subdivided into the anterior, internal and posterior internal. Its most frequent occurrence is in Mexico, Peru, Chili and Central Asia. The author reports six cases. The patients complained of something striking the eye immediately followed by pain. Two of these cases did not have pain; one had an infection, the other trachoma, accompanying the disorder.

The diagnosis was made by the discovery of longish bodies of a whitish color, with a darker tail possessing worm like movements. These bodies were situated at the limbus, in the tarsal conjunctiva and the fornix. They escaped on attempting to remove them with a Daviel spoon, but were paralyzed by a drop of 5 per cent cocain and were then easily removed. In five of the six cases the right eye was affected and the left eye only in one. In one case four, in three cases three, and in two cases two bodies were removed, of about 1 mm. long by 0.3 mm. broad, which were recognized as fly larvae. After the extraction of the larvae the pain ceased immediately and the conjunctiva returned to its normal state.

Larvae gain access to the interior of the eye by three possible routes, directly thru the cornea, the sclera or thru the blood vessels and lymphatics.

D. F. H.

Piccaluga. Ophthalmomyiasis Due to Rhinoestrus Nasalis, de Geer. Ann. di Ottal., 1922, v. 50, p. 79.

A girl of seventeen reported that she was hit in the eye the day before by a foreign body borne by a gust of wind At the first examination nothing was seen, but the next day the pain and inflammation was increased and the lids were edematous. In the lower wall nine small larvae were seen, 1x.4 mm. in size. They adhered tightly to the conjunctiva by means of hooks but were removed with forceps. Twenty-four hours later all symptoms had disappeared. The larvae were identified by the entomologic department of the university as larvae of Rhinoestrus Nasalis de Geer. From other reports in the literature, it is concluded that the larvae are probably deposited as eggs in a sac, by a very rapid manipulation on the part of the adult female, who apparently can deposit them during the actual course of its flight. The author has seen one similar case, a laboring man, with about twenty larvae in his conjunctival sac.

S. R. G.

Maggiore, L. Larva of a Diptera in Anterior Chamber. Ann. di Ottal. 1922, v. 50, p. 67.

Larvae in the conjunctival sac are fairly common altho only six cases of ophthalmomyiasis of the interior of the globe have been reported. The author had reported a short time before a larva of the same species as in the present cases deeply imbedded in the episcleral tissues. Of the previous cases three were in the anterior chamber and three in the subretinal space, which they had evidently reached from the blood stream. Maggiore's case was a boy who had noticed a month before a small white spot the size of the head of a pin in the anterior chamber, just beneath a white corneal placque which had been present since infancy. This white mass increased in size and after two weeks the eye became painful.

When seen by the author, the mass was the size of a grain of wheat, and under the corneal microscope could be seen to possess a segmented structure and the double tapering shape of a cigar. In these respects it exactly resembled the larva which the author found in his previous case. No motility of the insect could be detected, and one end of it was adherent to the cornea and iris. As much of it as possible was removed by a peripheral incision with forceps. A few pieces remained adherent to the iris, and in a few days the patient returned with acute glaucoma. An iridectomy was performed at the site of the implanted worm, resulting in recovery with vision 8/10.

The larva was evidently, as in the previous case, that of *Hypoderma bovis*. It is not clear how it entered the eye. It was probably inplanted as an egg by a sting of an adult fly, altho there was no history of such an accident. Inflammatory symptoms came on only when the worm began to disintegrate. In connection with this case, Maggiore showed also a picture of a woman with an extensive cancer involving the lids and cheek, with a necrotic area at the center, which was occupied by numerous larvae of a fly which were still living.

S. R. G.

Young, George. On Macular Perception in Advanced Cataract. Brit. J. Ophth., v. VII, 1923, p. 167.

The test to determine the function of the macula in cases of cataract, where it is impossible to examine it by the ophthalmoscope, is a follows: four discs are required which fit in a trial frame. The first contains a cross thread which is used to secure exact centering of the trial frame. This accomplished, the disc is removed and a second one with a single pin hole is substituted. A frosted electric bulb is brought up in close contact with the disc. The patient is then requested to look for a spot of light. If observed, it looks like a little moon. This is followed by discs with two and three pinholes respectfully, the holes being separated about 3 mm. The light is again brought forward, and the patient states the number of little moons and their position. The pinholes may be placed horizontal or vertical, the patient indicating the position of the moons, whether side by side or one above the other. The moons may overlap slightly. Precise statements of this character could not be given without direct fixation. Direct fixation is impossible unless the macula functions.

D. F. H.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph L. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. G. McD. Van Poole, Honolulu; Dr. E. B. Cayce, Nashville, Tenn.; Dr. Gaylord C. Hall, Louisville, Ky.; Dr. Edward D. LeCompte, Salt Lake City.

DEATHS.

Dr. Carl von Hess of Munich died recently at the age of sixty years.

Dr. Robert Smith Doak, Nashville, Tennessee, age fifty-seven, died July fourth.

Dr. William L. Wood, Portland, Oregon, age fifty-nine, died July fifteenth at Monrovia, California, following a long illness.

Dr. George Edgar Benson of Minneapolis, aged forty-six, died July thirty-first of endocarditis.

Dr. John W. Murphy of Cincinnati, emeritus professor of ophthalmogy, University of Cincinnati, age sixty-seven, died suddenly August third of cerebral hemorrhage.

PERSONALS.

Dr. C. J. Adams, Kokomo, Indiana, is taking special work at Moorefields, London, and will go later to Vienna, Budapest and Berlin.

Dr. S. M. Morris, formerly professor of ophthalmology, otology, and laryngology, has become professor of ophthalmology at the University of Texas.

Dr. William F. Holzer, Worcester, Massachusetts, formerly of the City Hospital, Boston, has been appointed oculist-in-chief at the Memorial Hospital.

Dr. Frank L. Alloway has resigned as chief of the eye, ear, nose and throat service at the U. S. Public Health Hospital No. 76, Maywood, Illinois.

Dr. James Moores Ball of St. Louis has been elected a member of the Ophthalmological Society of the United Kingdom.

Dr. Charles B. Kobert, director of the trachoma bureau of the Kentucky state board of health, left Louisville July twelfth to conduct a field clinic in a tour of central Kentucky for the treatment of victims of trachoma.

The Knapp medal has been awarded to Dr. Martin Cohen of New York, for his work on "The Significance of Pathologic Changes in the Fundus in General Arterial Disease and Nephritis."

Dr. Casey Wood addressed by invitation recently the Auckland, New Zealand, branch of the British Medical Association on "Some Recollections of my Clinical Teachers." Dr. Wood has been spending the summer, i.e., the South Sea winter, in Polynesia, making a study of comparative ophthalmology. When last heard from he was in Western Samoa.

Dr. and Mrs. T. M. Li returned to Peking on June 23, 1923, after spending about fourteen months in America. Dr. Li devoted most of his time to special study in ophthalmology in Boston and New York. On July 1, 1923, Dr. Li was promoted to the position of associate professor of ophthalmology, Peking Union Medical College. He will be acting head of the department during Dr. Howard's absence, during the school year, 1923-24.

Dr. Harvey J. Howard, professor and head of the department of ophthalmology of the Peking Union Medical College, Rockefeller Foundation, Peking, China, returned to the United States for a year's furlough on August 9, 1923, after a period of service of four years in Peking. Dr. Howard spent the years 1910-15 doing ophthalmologic work in Canton, China, in connection with the foreign work of the university of Pennsylvania and the work of the Canton Christian College and the Canton Hospital. Dr. Howard will establish his family in Philadelphia, and in October is planning to go to Europe, where he will spend six months prior to returning to America.

Dr. Adelbert Fuchs of Vienna will arrive in Peking on or about September 1, 1923, to be visiting professor of the department of ophthalmology of the Peking Union Medical College for a period of one year. A nine months' postgraduate course in ophthalmology at the college will begin on September 17, which is being given primarily for those engaged in teaching ophthalmology and for those who intend doing intensive scientific work in that specialty. The feature of the course will be "Pathology of the Eye." It is estimated that twelve physicians will be in attendance for the nine months' course, the teaching of which will devolve mostly upon Dr. Li and Dr. Fuchs, with the assistance of Dr. W. P. Ling, Dr. H. T. Pi, Dr. G. Tibus Dzen and Dr. T. P. Lee.

SOCIETIES.

The Indiana State Medical Association meets September 26-28 at Terre Haute. The eye, ear, nose and throat section will have a two days' program.

The Montana State Oto-Ophthalmologic Society was organized at a meeting of specialists in Butte, July 11. Dr. Glenn O. Dayton, Butte, was elected president and Dr. Laurence G. Dunlap, Anaconda, secretary-treasurer. Semi-

annual meetings will be held, the first in January in Aanaconda.

The International Congress of Ophthalmology, which was to have met in 1925, finds with regret that it is unable to do so in accordance with conditions under which the invitation was accepted by the Washington Ophthalmological Congress in 1922. It was decided at the last congress that the next session should be strictly international and that German should be one of the official languages. The committee has since been informed that the Société Française d'Ophtalmologie, the Société d'Ophtalmologie de Paris, and the Société Belge d'Ophtalmologie have passed resolutions to the effect that they felt unable to participate in a congress if Germans are invited. The committee believes that to proceed under these circumstances would be inadvisable and it has therefore reluctantly decided to postpone the congress.

MISCELLANEOUS.

Under the will of Simon R. Weil, the Society for the Relief of Destitute Blind in the Bronx, New York, was left $1,000.

By the will of Gertrude I. Duncan of Mt. Vernon, New York, the Society for the Improvement of the Condition of the Blind was left $5,000.

Under the will of Mrs. Ellen M. Chipman, a bequest of $5,000 was left to Dr. Don M. Campbell of Detroit for the study of eye, ear, nose and throat diseases.

About forty American ophthalmologists and laryngologists arrived in Vienna August fourth with Professor Mackenzie, of the University of Pennsylvania, to follow special courses of lectures to be given for them at the University of Vienna.

A new journal, Acta Ophthalmologica, will appear this month in Copenhagen, edited by Dr. K. K. K. Lundsgaard, who will be helped by correspondents in Lund, Helsingfors, Christiania, Copenhagen and Upsala. The journal will be published in English, French and German.

The Trachoma Hospital, of Morristown, Tennessee, will be moved to Knoxville about September 1 and will ocupy the Staub home which will be on the Health Center grounds. The entire hospital equipment will be furnished by the federal government. Dr. J. E. Smith will remain in charge.

The collection of books for the blind in the Chicago public library has become one of the largest in the United States. The blind from nearly every state in the Mississippi valley patronize this collection, because of its ready accessibility. Anybody can apply for a loan, and the government permits the books to be sent out in franked envelopes. The number of available volumes in raised printing is comparatively small, but the Chicago library, with 3,500 books, claims to have virtually everything ever published for the benefit of the sightless.

Dr. Ignacio Barraquer of Barcelona, Spain, will give two courses in Ophthalmology in 1924.

The first course will be given in April, May and June, and will cover the subjects of anatomy and pathology, external diseases of the eye and adnexae, ophthalmoscopy, the use of instruments of precision such as the corneal microscope, the slit lamp, the Bjerrum screen, etc., and finally, ophthalmic surgery.

The fee for this course will be 150 pesetas, the equivalent of about $25 per month.

A second course, limited to ophthalmic surgery with especial attention to cataract extraction by the Barraquer method, will be given in June, 1924, to men who are qualified by training and experience. The fee is 250 pesetas, about $40. This course is limited to six or seven men and application should be made as soon as possible to Dr. Ignacio Barraquer, Ronda San Pedro, 3, Barcelona, Spain.

Dr. Barraquer will be assisted in both courses by the associate professors of his clinics. Barcelona is a delightful city for a sojourn of a few months. The hotels are excellent and the prices, even at the Ritz, are surprisingly moderate. A knowledge of Spanish, while not absolutely essential, will be very helpful. Interpreters can be obtained, however, at relatively small expense, which, if shared by several men, becomes negligible.

At the meeting of the AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS held at San Francisco, June 26, 1923, the certificate of the Board was granted to the following:

Joseph Ellsworth Beideman, Norristown, Pa.
Paul Dee Berrisford, St. Paul, Minn.
Morton Emmons Brownell, Oneota, N. Y.
Abram Breneman Bruner, Minneapolis, Minn.
Alfred Cowan, Philadelphia, Pa.
Frank Wilson Dean, Council Bluffs, Ia.
Richard Irving Dorge, Minneapolis, Minn.
Clarke Bertern Fulkerson, Kalamazoo, Mich.
Everett Logan Goar, Houston, Texas.
Hendrie Walter Grant, St. Paul, Minn.
Halstead Shipman Hedges, Charlottesville, Va.
Archibald Wilcox Howe, Minneapolis, Minn.
Joseph Paul Israel, San Francisco, Calif.
William Gilliam Kennon, Nashville, Tenn.
Frank Norris Knapp, Minneapolis, Minn.
Carl Charles McClelland, Detroit, Mich.
Charles Bramman Meding, New York City, N. Y.
Howard McIlvain Morton, Minneapolis, Minn.
Lloyd Leslie Nelson, Norfolk, Neb.
Orla James Park, Schenectady, N. Y.
Jesus Mariano Penichet, Havana, Cuba.
Wallace W. Ralston, Houston, Texas.
Milton Barney Seligstein, Memphis, Tenn.
Carl Gustav Swendseen, Minneapolis, Minn.
Edwin Dial Watkins, Memphis, Tenn.
Webb William Weeks, New York City, N. Y.
William Hamlin Wilder, Chicago, Ill.
Oscar Wilkinson, Washington, D. C.
Merritt Whitacre Wheeler, St. Paul, Minn.
John A. Winter, Duluth, Minn.
Claude Thomas Wolfe, Louisville, Ky.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in **heavy-face type.** The abbreviations mean: (Ill.) illustrated; (Pl.) plates; (Col. Pl.) colored plates. Abst. shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper. Under repeated titles are given additional references to papers already noticed. To secure early mention, copies of papers or reprints should be sent to American Journal of Ophthalmology, 217 Imperial Building, Denver, Colorado.

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Bing, R. Brain and eye. (Gehirn und Auge). 85 pages, 59 illustrations, Munich. F. Bergmann, 1923. Münch. med. Woch. 1923, v. 70, p. 782.

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Lapersonne, F. de, and Cantonnet, A. Manuel de neurologie oculaire. Second edition, 1 volume, 416 pages, 113 illustrations, 4 color plates. Masson et Cie, Paris, 1923. Presse Méd. 1923, June 27, p. 1076.

Maxwell, S. S. Labyrinth and equilibrium. 164 pages, 11 illustrations, Philadelphia and London. J. B. Lippincott Co., 1923. A. J. O., 1923, v. 6, p. 708.

Official history of the war, Printed and published by H. M. Stationery Officer, 1922. Brit. Jour. Ophth. 1923, v. 7, pp. 393-396.

Peter, L. C. Principles and practice of perimetry. Second edition, 281 pages, 161 engravings and 5 colored plates. Philadelphia and New York, Lea and Febiger. A. J. O., 1923, v. 6, p. 107.

DIAGNOSIS.

Bailliart. A new tonometer. Soc. Franç. d'Opht. 1923, June. Ann. d'Ocul. 1923, v. 160, p. 593.

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Dykman, A. B. Value of perimetric studies in visual defects. (4 fields) Northwest Med. 1923, v. 22, pp. 287-290.

Ferree, C. E. and Rand, G. Effect of intensity of illumination on acuity and test charts. (2 ill.) A. J. O., 1923, v. 6, pp. 672-675.

Fox, L. W. Heterophoria and astigmatism charts. (2 ill.) A. J. O., 1923, v. 6, p. 684.

Kleefeld. Senile physiologic alterations of macular region proved by Vogt's red free light. (bibl.) Bull. d. l. Soc. Belge d'Opht. 1923, No. 47, pp. 58-66.

Marbaix. Importance of general arterial tension to oculists. (dis.) Bull. d. l. Soc. Belge d'Opht. 1923, No. 47, p. 46.

Rasvan, N. Microscopy of living eye. Ann. d'Ocul., 1923, v. 160, p. 604.

THERAPEUTICS.

Beaumont, W. M.. Butyn versus cocain. Brit. Jour. Ophth. 1923, v. 7, p. 397-398.

Bengelsdorff. Zinc chlorid solution in ocular therapeutics. Klin. M. f. Augenh. 1923, v. 70, p. 771.

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